

Radio Control

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WIN BIG!

TAMIYA SWEEPSTAKES!—P.66

CAR ACTION

THE WORLD'S LEADING R/C CAR MAGAZINE

January 1995

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Losi** **XXT**

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Stuff
for '95**

we preview the best p.135

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contents

VOLUME 10, NUMBER 1 • JANUARY 1995

6 Editorial

8 Letters

DEPARTMENTS

14 Readers' Rides

19 Inside Scoop
by Chris Chianelli

24 What's New

212 Grassroots Racing

229 National
Organizations

234 Chris' Back Lot

COLUMNS

26 Troubleshooting
by John Huber

32 Pit Tips
by Jim Newman

34 R/C Doctor
by Doug Mertes

38 Scoping Out
by John Rist

48 Getting Started

202 Tech Head
by Frank Masi

THRASH TESTS

52 Team Losi Double-Xt
Double trouble
by John Howell

features

78 Project Inferno 10
Flamin' flatbed
by A. R. Flatbush

89 Time Warp:
Tamiya Wild Willy
A blast from the past
by Stan VanDruff

93 How to Drive
Monster Trucks
Not like this!
by John Howell

98 ROAR Stock
Off-Road Nats
No free rides
by George Gonzalez

135 Start the
New Year Right!
It's resolution time!

136 New for '95
Go-fast goodies • by staff

142 How to Build Your
Own Track
Start diggin'
by Rick Schwartz

148 1995 Racing Season
at a Glance
Pack your gear for this year
by George Gonzalez

154 Reader's Rides
of the Year
We pick five winners
by John Howell

158 IFMAR 1/12-Scale
Worlds
Ooh la la! • by Ernie Provetti

214 Win Parma's
Project '29

60 MRC MT-10M
Low-buck monster truck
by John Howell

68 Flying Point
Jet Probe
Flying economy—with class!
by John Huber

Happy New Year!

It's 1995! What do we have in store for you this upcoming year? Well, as a matter of fact, lots of things!

To help us get the best info and produce the most "killer" articles possible, we've planned out the next six issue *waaaay* in advance. Wanna sneak a peek at what's coming up? Well, here's what we've got so far:

- A comprehensive four-car 2WD buggy comparison.
- A huge, "everything you want to know about electric motors" article.
- A monster truck special!
- Our annual Top Ten issue.
- An entry-level truck comparison.

Not too bad, huh? Keep your eyes peeled.

But that's not all.... You'll see some of the hottest features ever seen in *Car Action*, including three new columns. Check 'em out:

- Getting Started—everything beginners need to know.
- Grassroots Racing—showcases all you racers out there on the local level.
- Tech Head—for those who can't get enough of the technical aspect of our hobby.

We hope that you'll all be as into the new stuff as we are.

So we've been a particularly busy crew, lately, and we're moving ahead with a new enthusiasm and energy that has never before been seen in the magazine; we hope you all enjoy it. Write, or e-mail us over the Internet, and let us know what you think.

As for this issue, there are a lot of really cool features for you to check out. Along the lines of starting the New Year right and all that resolution stuff, there's a racing preview of the hottest races of the '95 season; info on how to race on your own track; and last—but certainly not least—an early look at all the new products that will be unveiled this year.

Also, at this time, I'd like to congratulate our managing editor, Karen Jeffcoat, and associate editor, John Huber, on their recent marriage. Any gifts can be sent directly to me, and you can be sure I'll deliver them in person (just make sure it's cash and not a check). All kidding aside, it couldn't have happened to two nicer people, and everyone here at *Car Action* and Air Age Publishing is very happy for them.

And to all our readers, thanks for being there. Here's hoping 1995 is a good year for all of you!

John Howell

We want to hear from you!

Write, fax, or e-mail us over the Internet: *Car Action*, Air Age Publishing, 251 Danbury Rd., Wilton, CT 06897; fax: (203) 762-9803; e-mail: chrisc@airage.com; [John Howell \(Doog\)—johnh@airage.com](mailto:John Howell (Doog)—johnh@airage.com); Karen Jeffcoat Huber—karenh@airage.com; John Huber—jhuber@airage.com; Frank Masi—frankm@airage.com.

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LETTERS

ERRATA: In the Buyers' Guide section of our November '94 issue, we printed an incorrect phone number for Advanced Products. The correct address and phone number are: Advanced Products, P.O. Box 1193, Middleton, MA 01949; (508) 777-0380. We apologize for any inconvenience this might have caused.

HOW NOT TO USE THE DICTIONARY

Totally egregious mag! It's very multitudinous with its superbly eminent photos and designating articles. The reason that I write this bemused letter to you is to ask that if I can get an MRC Juice Pack to fit in my new RC10T, would it be compatible with my Airtronics Contender ESC and Trinity Green Machine 2 motor? **JASON (ANALOGUE) MILLS**
 Raleigh, NC

Analogue, your hirsute request is a pedagogic fallout, luminescent and planoconcave. Secern your eggbeater and planish the digitation. In other words, NO! **KJH**

AND THE CROWD CHEERS FOR PLR

I noticed that October's issue paid more than the usual attention to the ever-growing concept of parking lot racing. I agree totally with the fact that PLR is needed more than ever. If this hobby of ours is to continue thriving, manufacturers and racing facilities have to make competitive racing easier for those who can't keep up with the constant flow of newer and better products. I know, because I've had friends who spent hun-

dreds on all the high-tech stuff and never even got to race them once. Granted, there might have been some who failed to "look before they leaped," but a few months ago, there was no alternative to racing. Now there is. Again, my congrats on a job well done.

HUNTER PROVONOST
 Cheshire, CT

Well Hunter, all of us here at Car Action feel that PLR is a very positive and inexpensive form of racing that everyone can enjoy, and we're going to continue to support this category heavily. **Doog**

MYSTERY RIMS

In your November '94 issue, you did a Thrash Test on the Tamiya Castrol Celica by Paul Onorato that had one slight problem. It failed to mention on the spec chart (page 83, under "Options Tested") anything about the wheels/rims. It looks as if they're aluminum, and they do not come with the kit. The kit contains white plastic wheels. You listed plastic wheels in the spec chart, but there's nothing under "Options Tested" about those rims. They're nice-looking; where did they come from?

MIKE DUNN
 Glendora, CA

You're right. Paul forgot to mention where those rims came from. The answer is Tamiya. The rims (part no. 53140) are made of aluminum, and they're true works of art. The center spokes are glass-beaded for a matte look, while the outer rim is machined to a high polish. I wouldn't recommend that you use them for off-road bashing because they're expensive, but they sure do make the car look cool! The rims will fit any one of the Tamiya 4WD or FWD cars, and they're also available in a mesh style. Nice catch, Mike!

John

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897-3035. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

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John Howell: johnh@airage.com.
 Chris Chianelli: chrisc@airage.com.
 John Huber: jhuber@airage.com.
 Karen Huber: karenh@airage.com.

WILL WORK FOR PARTS

Yo! Great mag! The reason I'm writing is because I want to get a Traxxas Nitro Hawk. I would go

(continued)

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News! Mike Wood Jr. takes Victory
Lap in Pro-Mod at the Indianapolis
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LETTERS (continued)

and buy one at a hobby shop, but my parents won't let me; they say that it's too expensive. I tried to build one and buy little inexpensive things here and there. Well, it didn't work, so I'm looking for anyone who has any parts for the Nitro Hawk. Please help! I really want to get into gas!

QUINN STEVENSON
611 Orchard Dr.
Redlands, CA 92374
(909) 792-2903

SCRATCH THAT

I'd like to know if I should build a car from scratch or if I should buy a car. I want a car that's fast but inexpensive. I'm 11 years old and don't have lots of money to spend. I like Team Losi.

GEOFFREY ALLEN
Princeton, IL

Geoffrey, Team Losi likes you too!

As for building a car from scratch; the time and money you'll spend will probably not be worth the effort. I recommend that you try a good beginners' car, such as Losi's Junior 2 or Junior T. They're both good vehicles with hop-up potential, and they're very reasonably priced. Trust me; you'll have more fun and success with one of these.

John

CHEAP TRICKS

I have a Futaba FXT racing truck. I was wondering if you could give me some inexpensive tips to upgrade my truck. I already have ball bearings, a 427 modified motor and a Slot Machine. Can you help me?

DOUG GILBERT
Plantation, FL

Doug, you're already on your way, but you should also consider some other options. If you don't have an electronic speed control, get one. The speed of the truck will be much easier to control, and you'll get better run times as well. After that, all I can suggest is oil-filled shocks. While I'm not sure if Futaba makes a set for your truck, you should be able to adapt any shocks from Tamiya, Associated, or Losi. After that, I wouldn't spend too much more!

John

TYCO TIME

I own a Tyco Super Fast Traxx; it uses twin 380-size motors. I was wondering if anyone makes an after-market 380-size motor. Your magazine is great. Thanks.

JUSTIN RIOLO
Brookings, OR

There isn't much you can do to modify a Tyco car, but you might be able to get a better set of motors for it. Kyosho sells a modified 380-size motor for airplanes, and you might be able to use them in your car. The only concern is whether the stock Tyco speed control can take the extra power of the motors. I don't know how hot the motors are, so if you decide to try it, you're on your own. Good luck and be careful!

John

REACHING OUT

I've been involved in R/C cars for about a year now. I've just started racing on an off-road track. I race a JRX-2 with a Novak 410-M5 speed control, a Novak receiver, Panasonic Pushed P-170 batteries and a Motor Man 15D motor. I'm a pretty good driver; I just need someone to practice with. Could you print my address and phone number so I can try to find a person in my area who has the same problem? We could get together, exchange ideas and race at my local track. Your mag is the best; don't change anything.

DERRICK SCHNARR
Huntingburg, IN

Derrick, buddy, I hate to tell you this, but we lost your address. If you send it to us again, we'll try to print it in the magazine for you. I don't know whether you're interested, but we're starting a new Classified Ad section—a place where you'll be able to reach out and talk to everyone who reads the magazine. It's open to everyone, and has commercial and non-commercial rates. You'll be able to buy, sell and swap equipment, meet people with common interests, advertise your local club, etc. Stay tuned; it's coming up pretty soon.

Doogie

DOG DAYS OF R/C

Tim Ehlers of Indianapolis, IN, sent us this shot of his Associated RC10T, which has been modified with goodies from RPM—front and rear suspension arms, rear hub carriers and a 2.65 Stealth Conversion kit. Other miscellaneous mods include Pro-Line chrome wheels and Road Hawg tires, a PSE “Killer-T” body, a Novak 2x receiver and an HPC speed control, Tecnacraft titanium tie-rods, a Trinity Slot Machine motor, MIP CVDs, a Litespeed heat sink and connectors, and a Custom Racing Products bumper.



MIX 'N' MATCH

Gary O'Connor of Santa Rosa, CA, started out with a Cobra graphite chassis and an RC10 gearbox. He then added a 10L front end and a small piece of G-10 epoxy plate to mount the gearbox and rear A-arms on. A Novak ESC and a Futaba radio round out the electrical department. The really trick item on this ride is Gary's home-made “moon” wheel covers, which he made out of the bottoms of aluminum soda cans. Also note the hot Dahms body decked out with Autographics decals, the roll cage made from Plastistrut material and the aluminum, 1/4-inch-diameter, exhaust pipes.



SOUPED-UP SRT

This hot-looking Traxxas SRT comes from Marc Mamiye of Elberon, NJ. Marc modified his truck with an Extreme 13-turn double motor, a Tekin 411G2 and an Airtronics servo, and he controls it with a Futaba Magnum Jr. radio. The truck also has a set of Pro-Line XTR 90s all the way around. In the near future, Marc intends to modify his SRT with a Team Losi Hydra Drive.



“Readers’ Rides” is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers’ Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897-3035. If we choose your photo, you’ll receive a 1-year subscription to Car Action, or an extension of your existing subscription. You’ll also be eligible for the sixth annual “Reader’s Ride of the Year Contest” in January 1996. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



STREET ROD ACTION

Jason Niemier and Billie Wilson—both from Fort Dodge, IA—sent us this photo of their awesome-looking street rods. Jason’s ride is the red Parma ’29 Roadster, which has working headlights, tail-lights and brake lights and is equipped with gold-anodized aluminum wheels, a Novak Rooster and Futaba radio gear. Billie’s purple Bolink ’34 Ford Vicki is also decked out with a Novak Rooster and Futaba radio gear. Nice rides, guys! But just out of curiosity: who would win in a drag race?

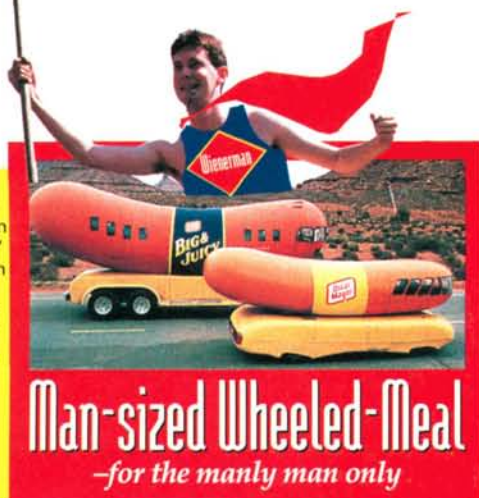
INSIDE scoop

In search of fun
and glory, cause
life's too short
to be a sheep

• by Chris Chianelli



Our hairy-chested editor, John "Doogie-dog" Howell, has an unbelievable appetite for a 140-pounder. This guy truly has a hollow leg! Guess what makes up a very large part of his diet? You got it—Oscar Mayer wieners. He's truly a "wiener-cuisiner." Doogie's obsession with hot dogs has gotten so very bad; he's tormented nightly by a recurring dream: he and the Wienermobile are just about to get the checkered flag at the Indy 500 when, all of a sudden, Emerson Fittipaldi, broken down on the side of the track, rolls a 55-gallon drum of spicy mustard at the Wienermobile. Doogie goes off the track, waking in a cold sweat just as he and the Wienermobile are spogged in a mass of mustard. Careful, Doog, this dream could come true. The 5,800-pound Wienermobile *does* exist! Designed by Steven's



Man-sized Wheeled-Meal
—for the manly man only

Automotive Corp. (designers of the classic Excalibur), Wienermobile is built on an '88 Chevy van and powered by a V-6 engine. (Lots of V-6s at Indy, Doog; could be an omen!) The Wienermobile features a microwave oven, refrigerator, steamer (you can do some serious eating and driving in this one, Doogie!), CB, telephone and a tape deck that plays 21 versions of the Wiener jingle. The Big & Juicy (pictured in the background) is still top secret. Will Doogie dream of daring re-entries in the space shuttle Big & Juicy!? Tune in next time for, "The Adventures of Doogie—The Daring Dog-a-Naut."

Batteries

Trinity has repackaged its Ex•Tech Performance Paks and World•Tech cells into some very useful boxes. "Useful?"

How's that?," you might be asking at this very moment. We've all had our battery packs badly banged up while they thrash around in our toolboxes and race cases. It goes, however, way beyond that. We've all heard the stories about unwrapped packs shorting out against pliers, wrenches and the unprotected backs of power panels—all kinds of things. I've seen soldering bars glow bright red from shorting-out cells—pretty ugly

and very dangerous. These sturdy boxes, newly introduced to the American market, are widely used by Europeans to transport packs to and from the track under much safer conditions than we're accustomed to here in the States. Also new is the Panasonic 1800Z cell that will be used in the new Ex•Tech Performance Pak. This replaces the old Power Link Pak that used the Panasonic P-170 cell.



in a Box



three years ago! The cool part is the "Universal Soldier" visor that receives the signal and sends the picture to a viewer that's mounted in the visor (the viewer is much like an eyepiece on a mini video camera). It's fender-to-fender race action from both driver and spectator points of view—unbelievable! Don't ask where you can buy one; you can't—at least, not yet. I'm just telling you about it to inspire the electronically creative.



Considering the off-the-shelf microelectronics available today, I guess it was only a matter of time. Mounting a micro-cam in a vehicle is really nothing new; associate editor John Huber did that almost

From the Inside—Out



Virtually DUAL-COOL

[Can you believe how our friends in Japan are racing now?]

INSIDE scoop

Gas 'n' Shift



Check this thing out! It's Yokomo's wild new YR-10 GP. This 4WD gas-powered YR-10 is based roughly on the geometry of their popular electric touring car—the YR-4. This new car has Yokomo's RX 12C engine as well as

their all-new 2-speed transmission. From what I can tell, the car is also equipped with: an aluminum chassis plate; an upper fiberglass stiffener; a disk-brake system; aluminum, oil-filled, coil-over shocks; and a belt-drive setup. Availability in the U.S. is unknown at this time, but we're guessing that this is one item Yokomo *will* want to distribute here. It looks like a screamer!



You know that AM transmitter you gave to your 8-year-old cousin in an attempt to impress your relatives with your generosity? Well, I'd try to get it back, if you can—even if it means trading away your favorite collectors' item (that 8-track player with single-dial tone control and 14-way speakers!). According to Novak, their new Polaris AM receiver is a major leap in technology and performs better than most FM receivers. Even with entry-level AM transmitters, the Polaris grabs the signal and filters out the glitches while giving superior range compared with old, stock equipment. Designed to be glitch-free when used with electronic speed controls, its features include narrow-band operation, three channels, an external battery slot and reverse-voltage pro-



The Return of... AM RADIO

tection. It's compatible with Futaba-J, KO, JR and Airtronics connectors. For more information, contact Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715; (714) 833-8873; fax (714) 833-1631.

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On The Edge

It's the only way to be competitive



Last month, I showed you Pro-Line's new truck body with their new Pro-95 "Edge" front tires. Well, here's a close-up of those tires—the very same ones that Team Associated driver Mark Pavidis used to TQ in both Stock and Modified and to win the

Stock A-Main at the ROAR Nationals last year. Backed by extensive, on-track R&D, their features include XTR soft racing compound and a radial-rib design. And the Pro-95 Edge tires will fit any 2.2 front truck wheel! To hear more, contact Pro-Line USA, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781.



If you're into Trans Am or Euro-style sedan racing, Dahm's Racing Bodies' new M3 Extreme should turn you on. This low, wide, aerodynamic BMW body is designed to increase speed and handling for 1/10-scale gas-powered cars like the Serpent Impact, BMT 931, Parsec Prisma and Delta. The M3 Extreme features a large front spoiler, wheel flares and a separate rear wing. Contact Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316; fax (707) 792-0137.



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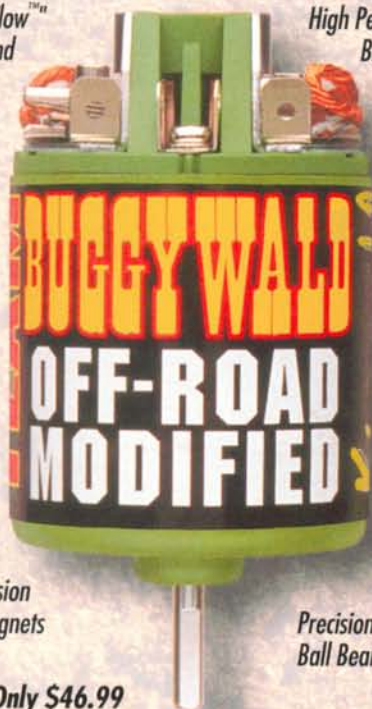
13 Turn Double Machine Wound "Short Stack" Armature

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"If my first Modified Motors had been this fast, I'd been World Champion a lot sooner."

— Brian Kinwald
Current IFMAR World Champion



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Team Kinwald brings you the new "Hard Ones" off-road steel pinions. With a Zero Gravity™ design, each pinion is case hardened to a 58-62 Rockwell C hardness to a consistent depth of .0010". Only total destruction would cause tooth deformity. Last, a black oxide coating is applied to prevent rust prior to use. Kinwald "Hard Ones" are the longest lasting pinions available. In 48 pitch only, 12 - 27 tooth sizes. Only \$4.99.



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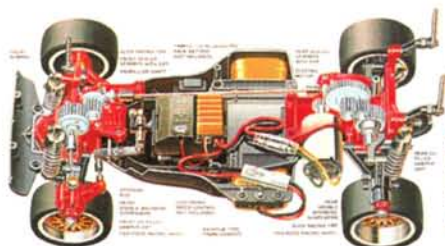


Tamiya stands Accused

If Tamiya were charged with "scale-model proliferation," not even F. Lee Bailey could obtain a "Not guilty" verdict.

Last month, I showed you their new F1 Ferrari

412 T1 and the Jeep Wrangler. This month, we have the sleek, 1/10-scale Nissan 300ZX IMSA-GT and the 1/8-scale OPS/Tamiya .15-powered 4WD GP Proto. I'll have more on the GP Proto soon.



The 300ZX chassis—Tamiya's familiar 4WD sedan type—features a new wide-tread design.



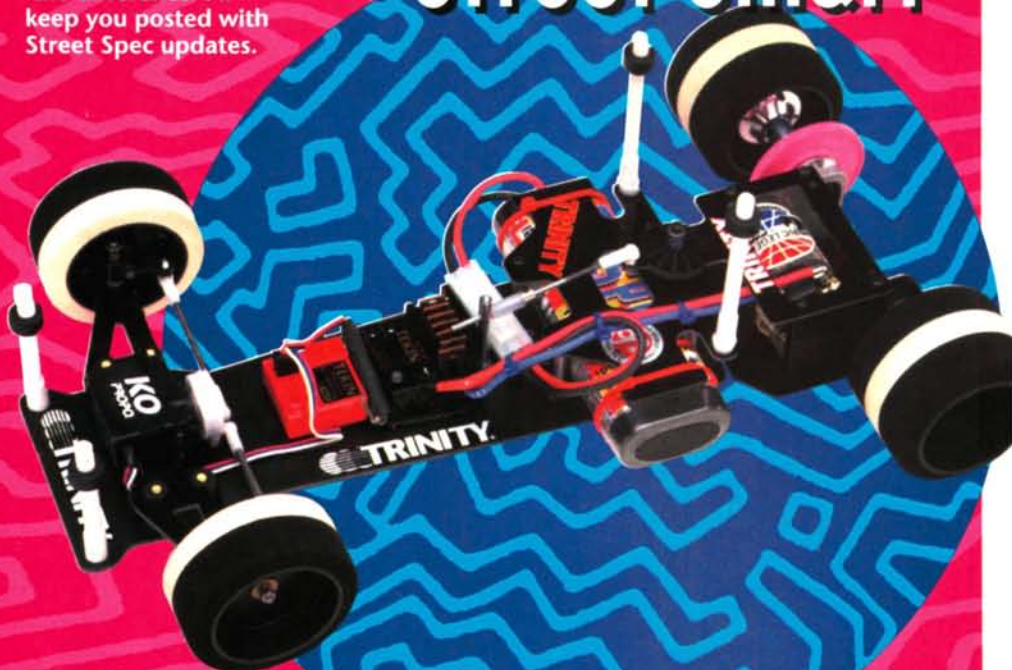
This 1/8-scale GP Proto—a departure for Tamiya—should be very fast with an OPS-built engine.

Considering all the focus on CCR (cost-controlled racing), Trinity's new S-Spec 10 racer and Street Spec Parking Lot Racing Program is a very smart idea. The S-Spec 10 car features a fiberglass T-bar chassis, sliding-pillar front suspension, an aluminum motor mount, Magic gears, Bolink short-track body and Spec tires, a motor and a battery. Costs have been controlled because there's no need to take 20 sets of tires to the track—only two different rear- and three different front-tire compounds are allowed in Street Spec, and they're easily identified by their white bands. Trinity EX-Spec batteries and motors also do their part in holding down the costs.

It seems to me that Trinity's Street Spec concept and their licensed equipment could offer high-speed, fair competition—without all the expensive extra parts and equipment that are usually made obsolete by the next wave of

even more expensive stuff! Ask your dealer for more information about Street Spec racing. Tell him it's the race where driving skill makes the difference. I'll keep you posted with Street Spec updates.

Street Smart



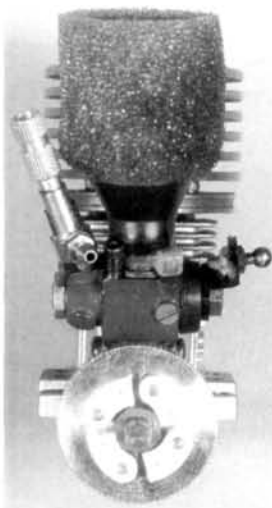
TEAM ASSOCIATED RC10GT Four-Shoe Flywheel

Make your RC10GT easier to drive with Team Associated's

new four-shoe flywheel. It provides smoother clutch engagement under acceleration and better compression braking. It uses two packages of the standard Associated no. 7601 clutch shoes (not included), which you trim according to the engagement you need. Complete instructions are included.

Part no.—7611; price—\$10.

Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342.



GLOBAL HOBBY DISTRIBUTORS AC/DC Quick Charger

The first product in the new Pro-Max product line, this unit is designed to charge 6- and 7-cell Ni-Cd battery packs of up to 1700mAh capacity in 15 to 20 minutes. It features a discharge switch, a 15-minute timer, an analog ammeter and an auto-trickle function with an indicator light. It's protected during AC use by a replaceable fuse, and cooling vents in the case top ensure the longest possible life.

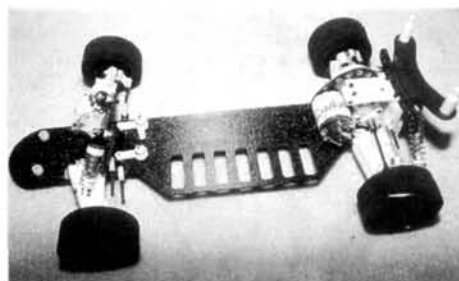
Part no.—885600; price—\$49.99.

Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728-8610; (714) 963-0133.



GRAND MOTORSPORTS The Hugger

Developed using full-size racecar technology, the Hugger takes advantage of weight bias to obtain optimum speed in the corners. It's based on the RC10 transmission and suspension components and is available as a complete car and as a con-



version kit with a high-quality graphite chassis, a T-61 aluminum bulkhead, a rear

mount, a front bumper, body posts and all the necessary hardware (plus instructions, of course!).

Prices—\$109.95 (kit), \$259.95 (with new RC10 parts).

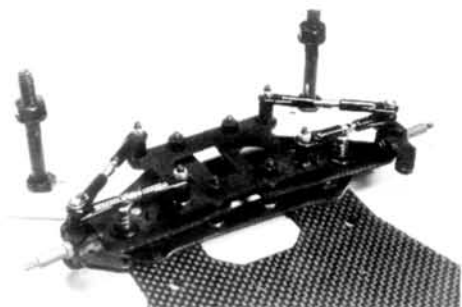
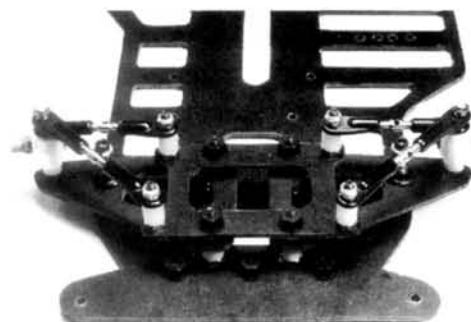
Grand Motorsports, 9360 Newton Ave. N., Brooklyn Park, MN 55444; (612) 424-5293.

BOLINK Vari-Link 1/10-Scale Front End

The Vari-Link's moving upper and lower control arms provide more correct suspension travel and allow you to adjust the static and variable caster and camber. Because the steering blocks don't move on the kingpin, they won't wear out, and you can adjust ride height by moving spacers above or below them. The A-arms are mounted in rubber bushings for long wear and smooth suspension movement. The Vari-Link will work with any steering block that fits an 1/8-inch kingpin.

Part nos.—BL-5209 (for LTO Pro cars), BL-5210 (for Road Pro cars), BL-5211 (for cars with RC10L front-end bolt pattern); prices—\$49.95, \$49.95, \$59.95.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245; (404) 963-0252.



CUSTOM ELECTRONICS Servo Analyzer

Find binding, kinks, bad servos and battery-capacity inadequacies before they stop you on the racetrack. Just plug the Servo Analyzer into your radio system between the receiver and various servos and linkages, and read the current meter.



Prices—\$19.95 (with two connectors installed), \$14.95 (without connectors).

Custom Electronics, RR 1 Box 123B, Higginsville, MO 64037; (816) 584-6284.



C&M/TEAM COBRA Battery Deep-Cycling Tray

C&M's battery tray comes fully assembled in a strong, injection-molded case. It discharges cells individually and reduces the likelihood of cell memory. A seventh resistor is provided for hump packs.

Part no.—3010; price—\$24.95.
C&M Mfg./Team Cobra, P.O. Box 701-353, West Valley City, UT 84170; (801) 974-5757.

DYNAMITE TNT .12 Nitro Hawk Conversion

This kit has everything you'll need to install a TNT .12 engine (purchased separately) in your Traxxas Nitro Hawk, including modified brake parts and all the necessary spacers and ball bearings for the clutch. The conversion, which takes only about an hour to do,

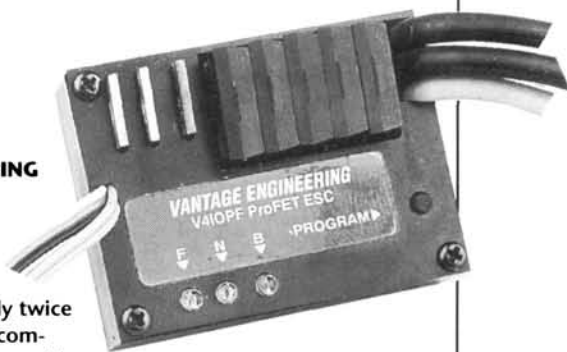


will provide a 25-percent increase in speed.
Part no.—DYN2265; price—\$14.95.
Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.

VANTAGE ENGINEERING V410PF ESC

This new speed control uses the latest ProFET transistors—which are nearly twice as large as the more commonly used FETs—to provide the lowest "on" resistance available (0.001 ohm), and there's no need for a heat sink. The Vantage V410PF has programmable torque control through a throttle-ramping feature, and you can program brake, neutral and full-throttle points using a single push-button and three LEDs.

Part no.—ES41P; price—\$219.95.
Vantage Engineering, 681 Main St., Waltham, MA 02154; (617) 894-8694.



TEAM CRC Quick Temp Temperature Label

Read your motor's temperature with accurate liquid-crystal technology!

Although most tapes read only peak temperatures and must be replaced after every run, Team CRC's is the only tape on the market that can read variable increasing and decreasing tem-

peratures; the band changes back to its original color and then is illuminated again. It's great for tuning engines and for determining proper gear ratios in electric racing!



Part no.—9003; price—\$6.95.
Calandra Racing Concepts, 6860 Stanwix Ave., Rome, NY 13440; (315) 338-0867.

DOUBLE STRIKE Battery Packs

Charged at 5 amps and discharged at 25 amps, these perfectly matched packs can take you to the winners' circle. Single-cell shrink-wrap, safety washers

and battery bars are included in each pack.

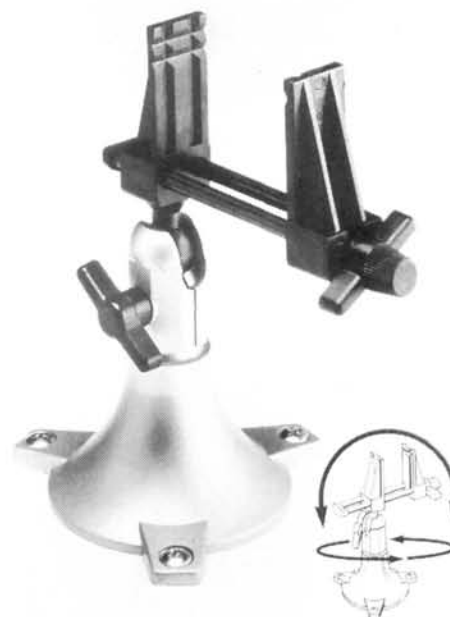
Part nos.—DSN6270 (6-cell 1700 Race Pack), DSS6270 (6-cell 1400 Race Pack); prices—\$41.95, \$32.95.
Double Strike Batteries, P.O. Box 5198, Central Point, OR 97502-0048; (503) 664-5841.



PANAVISE PRODUCTS PanaVise Jr.

The versatile PanaVise Jr.'s head can rotate 360 degrees and pivot 210 degrees; its jaws have a maximum opening of 2½ inches and are made of fiber-reinforced thermal plastic; and its die-cast zinc base can be screwed down or bolted to any work surface. It's perfect for soldering, drilling, painting, gluing, assembling—almost any hobby application. It's available at hardware stores, hobby shops and tool shops.

Price—\$19.95.
PanaVise, 1485 Southern Way, Sparks, NV 89431; (702) 353-2900.



KYOSHO 1/10-Scale Starter Box

Powered by a standard, rechargeable 6- or 7-cell Ni-Cd pack, this lightweight, red-anodized-aluminum starter box will keep you on the track all day! An included "remote" glow-plug receptacle simplifies starting; just plug it into your car or truck, and connect the remote to the glow-plug driver in the starter box. A meter on the box indicates that power is being sent to the glow plug, and a built-in caddy keeps extra glow plugs handy. The starter box is driven by a 550 motor and has a carrying handle and alignment pegs. Replacement parts are available.

Part no.—KYOP0500; price—\$99.99.
Kyosho/Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300.





TRUBLE SHOOTING

by John Huber

Gear Gobbler

I own a Tamiya Top Force with a RX 540VZ Technigold motor. After a few runs, I noticed it was a little louder, so I brought it in and found that the top of the rear tranny was loose and the pinion gear was worn. When I cleaned the gears, I ran it for about 10 hours, and the pinion fried. To my surprise, I couldn't find a pinion anywhere, but some guy was nice enough to take one out of an F1 kit. But that one fried in four battery packs. These pinions are sure hard to find, and they wear out fast. What

am I doing wrong? Should I replace the spur gear, too? Please help!
Aaron Matuszny
Malvern, PA

Aaron, the gears shouldn't wear out that quickly. On some Tamiya kits, the pinions are made of aluminum, and this might be part of the problem, but something else is doing them in. If there's excessive backlash between the pinion and spur, this will cause wear. It's also not good if the mesh is too tight. On your car, the mesh should be set by the holes you use to mount the



motor—be sure to do it according to the instructions. As for the spur gear, if you've already gone through two pinions, you can bet that the

spur needs to be replaced as well. Try to get steel pinions this time, and double-check to make sure the gears mesh properly.



Teething Pains

I own a DuraTrax LX-T gas conversion kit with an O.S. .12 CZ-Z engine. Every time I use the car, the spur-gear teeth become soft and strip because the clutch bell becomes too hot before I can finish half a tank. It's a little expensive to replace the gear after each run.

Ray Hass
McHenry, IL

Ray, I've used a DuraTrax conversion for many months, and I've never seen a problem like the one you describe. I doubt very much whether it has anything to do with heat. I bet the gear mesh isn't as tight as it should be, or the chassis is flexing a lot. If there's a lot of flexing, you should rig up some sort of brace to keep it to a minimum. Also, if you use 48-pitch gears, switch to 32-pitch.

Shot Joints

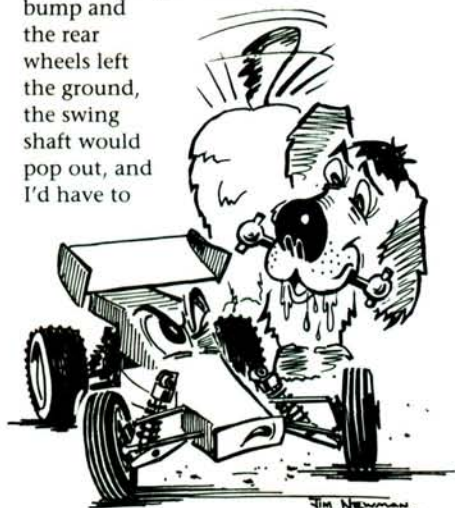
Help me, please! I bought a Mountaineer about four months ago, and I have a big problem. Everything is stock—right out of the box. After about five hours of driving time, the U-joints are worn through. I sent the truck to Tamiya, and they said there's no problem with it. What can I do to fix this? Do I need to have the U-joints machined out of harder material?
Brian Kurtz
Bend, OR

Brian, I'm not sure exactly why they're wearing out so quickly, but I think I might be able to help. If they're a golden brass color, that might be the problem right there. Brass is very soft and will wear out very soon. You might be able to find a set of 1/8-scale gas car universals that will fit. To prevent the ones you have from wearing out too soon, limit the severity of the joint's operation angle, and don't jam on the throttle or brake too hard. Also, keep them clean and well-lubed.



Dislocated Bones

I've been into R/C cars for about four years. About a year ago, I was given an RC10 Team Car. It worked great at first, but after a while, it started to make funny noises. I took the transmission apart and greased it. That took care of the noise, but a new problem developed: if I ran the car at high speeds, the left dogbone would pop out. I lowered the shocks a little so that the dogbone would go into the outdrive more. It worked, but if the car jumped or hit a big bump and the rear wheels left the ground, the swing shaft would pop out, and I'd have to



fix it. I recently bought some MIP CVDs, and they did exactly the same thing. I'm really getting tired of stopping in the middle of running to fix it. Help!

Greg Fueysper
San Angelo, TX

To prevent the bones from popping out, you have to adjust the spacers on your shocks and the shims on the axle. I know MIP gives very detailed instructions on how to set up the CVDs properly. Did you read them? Put spacers inside the rear shocks to limit their length when extended, and use shims on the axle to adjust how far the dogbones sit in the outdrives. And read those instructions!

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are available in a variety of hot anodized colors to complement any trick paint scheme.

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- CRP 00084 Titanium turnbuckle set—\$24.95
- CRP 00085 Titanium shock bushing—\$12.95
- CRP 00086 Titanium steering rods—\$10.95
- CRP 00087 Engine mount w/plate—\$22.95
- CRP 00088 Blueprint/ultralight flywheel—\$24.95
- CRP 00089 Racing throttle w/brake linkage—\$12.95

1/10 Gas RC10GT, Rampage, Inferno 10 conver

- CRP 00090 Titanium tie rods—\$10.95
- CRP 00091 Titanium turnbuckles—\$10.95
- CRP 00092 Titanium hinge set—\$22.95
- CRP 00093 Titanium front brace rods—\$12.95
- CRP 00094 Spec. receiver mount—\$12.95
- CRP 00095 Spec. tranny brace—\$4.95
- CRP 00096 Blueprint/ultralight flywheel—\$24.95
- CRP 00097 Titanium shock bushing—\$10.95

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- 13 3/4 wheelbase with stainless steel ladder bars and 6-32 ball ends
- All new steering with axle mounted servo bracket with brush guard for 2 wheel steer - (2 brackets & brush guards for 4 wheel steer version)
- Stainless steel hardware and Stainless steel torsion sway bars
- Full cantilever shock mounting system
- New, lower ride height (Hi-Riser version available)
- Lowest battery mounting position of any available kit.
- Receiver & speed controller tray
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All above features are included for \$225⁰⁰ with 2 wheel steer (\$250⁰⁰ for the 4 wheel steering version) no other kit offers all of these features and their upgrades, they cost more!

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TROUBLE SHOOTING



No-Go Radio

Please help me! I have an RC10 and a Tamiya Stadium Blitzer, and both run on Tekin 408 Sport speed controls. They both run on the same radio—an Airtronics VT2P, and each has its own receiver. I just swap the receiver crystal back and forth. A

few months ago, my brother and I took our cars out, and when I turned mine on, the wheels turned to the right, the throttle didn't work, and the tires wouldn't turn back, either. So I put my crystal in the Blitzer, and it did

the same thing. When I got home, I checked out my cars, but didn't see anything wrong; so I tried it again. I turned my car and radio on, and the same thing happened again. I don't know whether it's my crystals or the whole radio that's the problem.

Stephen N. Santoyo
El Centro, CA

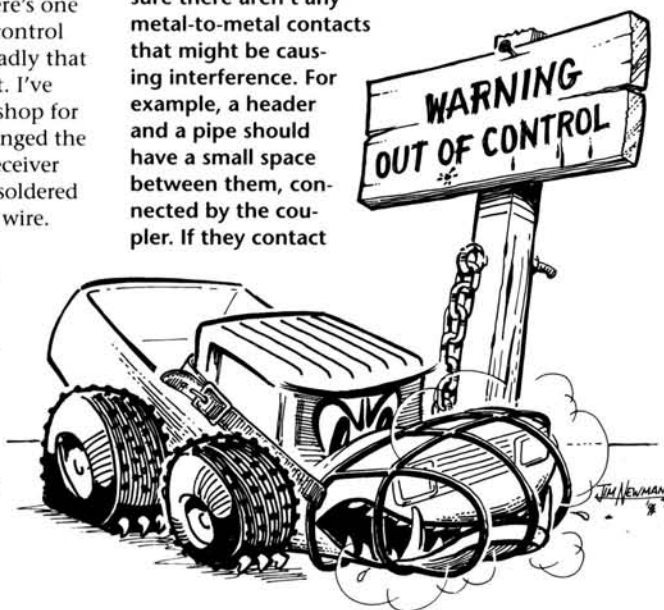
It's a good bet that your crystals are shot. Try a new set of crystals on the same channel. Chances are, you blew only one of the pair, so check which one it is by a process of elimination. If you broke the one in the transmitter, you have two for the receivers so you won't have to swap anymore.

Outta Control

I own a Traxxas Nitro Hawk, and it's equipped with a Futaba Magnum Jr. transmitter, an O.S. .12 CZ-R engine with a DuraTrax tuned exhaust system and heat-sink head, a 75cc Kyosho fuel tank and a KO Propo EG electric starter system. It runs well, but there's one problem: I can't control it. It glitches so badly that I can't even run it. I've asked my hobby shop for help, and I've changed the transmitter and receiver crystals, and also soldered in a new antenna wire. I've routed all the wires correctly, but the car still glitches. It's already made me wreck it, and I had to buy a whole new front end. Please help. Will Richardson
England, AR

Will, several things could cause this interference. Check to see how far your range is with the engine off. Walk away from the car, and see how far you get before you lose control over it. You should be at least 100 feet away before you lose range. Now make sure there aren't any metal-to-metal contacts that might be causing interference. For example, a header and a pipe should have a small space between them, connected by the coupler. If they contact

each other, the engine vibrations will cause interference as the metal rubs. It's also important to know that the receiver antenna wire should be a specific length. It isn't a good idea to lengthen or shorten the wire because you may mess up its "tune."



ROLL YOUR OWN!

If you race with foam tires, you *need* a tire truer. **MAXMOD** offers several sizes to suit your budget.

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20 pounds of pure muscle. Our top of the line unit. Massive torque with constant speed make short work of even the toughest tires. 120 VAC.



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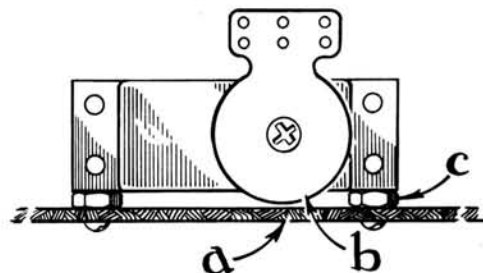
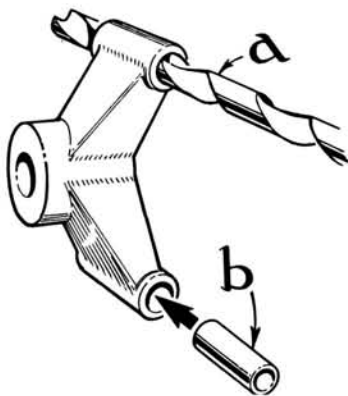
PIT TIPS

by Jim Newman

SLEDGEHAMMER HUB BUSHING

When the rear hub-carrier holes become worn and cause wheel wobble, drill out the holes with a $\frac{5}{32}$ -inch drill bit (a), then press in short lengths of $\frac{5}{32}$ -inch-o.d. brass tube (b). This will restore the carriers to "like new" condition and allow you to install the original pivot pins.

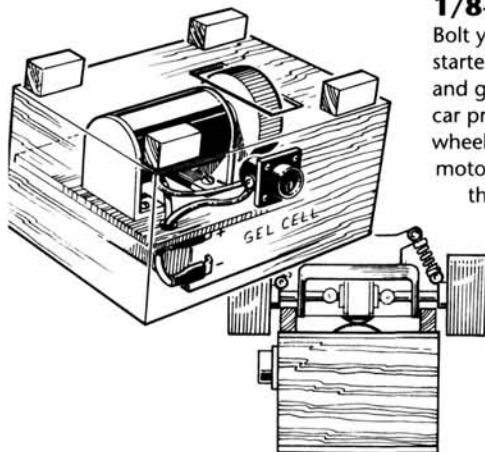
Rick Thompson, Freeport, IL



SERVO SPACERS

Instead of slotting the chassis (a) to clear a larger servo wheel (b), use large nuts (c) or a stack of washers to raise the servo off the chassis.

Mark Wong, Elk Grove, CA



1/8-SCALE STARTER

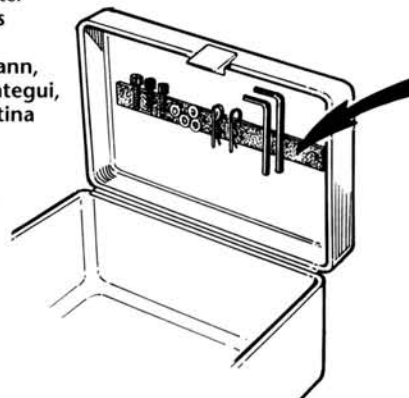
Bolt your starter motor into a box with the starter wheel sticking up through a slot, and glue four dowels or blocks to keep the car properly positioned over the starter wheel. You can take the switch off the motor and mount it on top of the box so that when you press down on the car, the starter will spin, or you can put a heavy-duty push button on the side. Bring your battery cables out through the end of the box, or put a gel-cell in a separate compartment, as shown.

Scott Brodersen, Florence, MO

SCREWS AND TOOLS RETAINER

If you have a plastic toolbox, use servo tape or glue to attach a magnetic strip to the lid to hold small screws, Allen keys, etc.

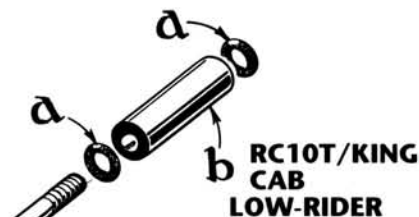
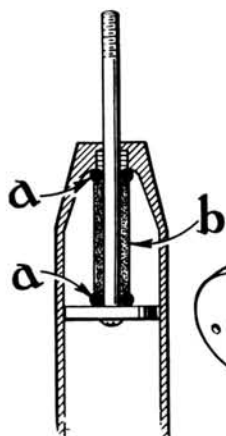
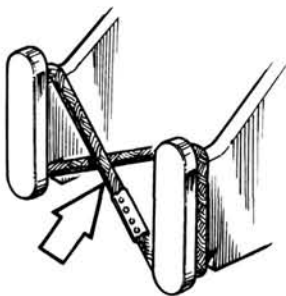
Andres Jorge Hollmann, Berazategui, Argentina



SCHUMACHER CRASH-BACK BANDS

Cloth-covered hair-tie rubber bands are better protected from nicks and abrasion than the regular O-rings provided on the Boss Cat, Pro Cat, etc., yet they perform just as well. See your drugstore for supplies.

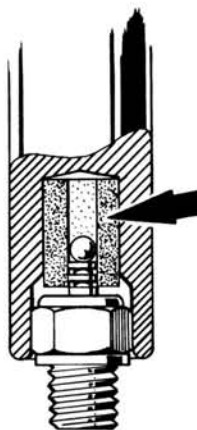
Tim Pula, Maitland, FL



RC10T/KING CAB LOW-RIDER

Use Kyosho O-rings (a) and a shock spacer (b) to shorten your shock travel and lower the ride height. This will also compress the springs for a firmer ride. Adjust the ride height by shortening the spacer.

Phil Macchio, Middletown, NY



GLOW-PLUG GRABBING WRENCH

Glue a piece of silicone fuel tubing into the cavity above the plug recess in your glow-plug wrench. When you remove the wrench from deep, finned cylinder heads, the tubing will grip the plug's center post and lift the plug clear of the hole.

Bryan Failing, San Jose, CA

TORQUE-LIMITER ADJUSTER

Check your ESC's plastic pot-adjusting tool; it has a hole at the top. Saw down to the hole to make a slot that will grip your ESC's torque-limiter knob (if it's equipped with one).

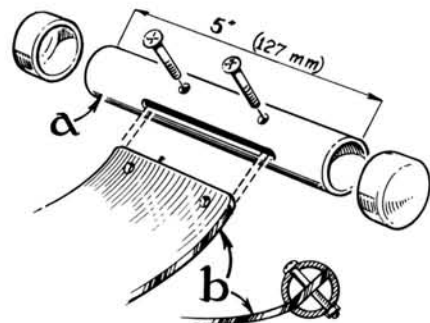
Mike Rommel, Prince George, B.C., Canada



VELCRO® BATTERY STRAPS

These were made to replace the standard cable ties, and they're much more convenient. Right- and left-hand straps (a) are cut 1/4 inch wide with a 1/2-inch-square tab (c) at the end for gripping. Remove glue with motor cleaner, and CA a piece of the hooked Velcro®-brand fastener (b) to the underside. A quick tug will release the pack.

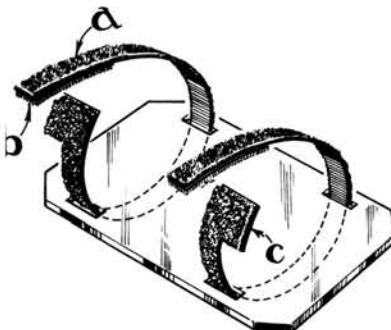
Sammy Becerra, Santa Clara, CA



ULTIMATE BASHER BUMPER

Cut a piece of 3/4-inch PVC pipe (a), slot and drill it as shown, then bolt it to a skid-plate extension (b), which can be made of thick plastic, such as flowerpot material. This costs about 90 cents and saves your front end from a lot of expensive damage! Endcaps are optional.

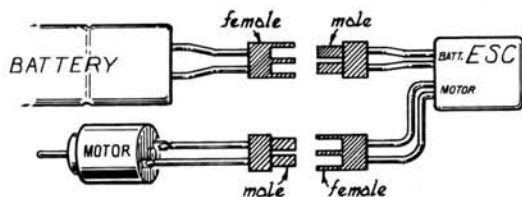
Eddie Jaramillo, Los Linas, NM



SAFETY PLUG/SOCKET INSTALLATION

Install your male and female connectors as shown so that it's impossible to cross-connect your motor and battery to your ESC.

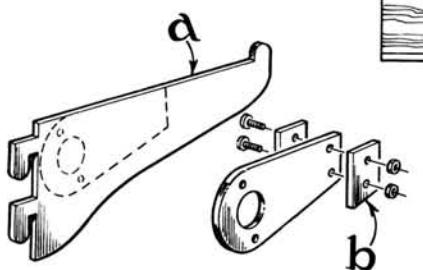
Josh Gum, Albany, NY



HOMEMADE HEAT SINK

Cut out of aluminum shelf bracket (a) with extra plates (b) screwed to each side to increase the mass of metal, the two small holes allow this heat sink to be screwed to the end of the motor case.

Paul Blunden, Newport, Isle of Wight, England



PURPLE HAZE Stock Racing Motor

The baddest stock racing motor on the planet! Everybody's winning with the PURPLE HAZE. Get one, tear it out of the package,

put it in your car, and go out and grab the checkers!!!



Powerzone Comm Drops

The simplest way to get more horsepower from any motor is to add one drop of the Powerzone! Reduces heat, increases power, decreases wear, extends run time, and lasts the entire run.

"Z" Cut Lay Down

"Z" Brushes

Install these brushes in any type of Lay Down Stock Motor and increase an average of 1,000 RPMs. More and more racers are finding this secret. Don't get left in the Haze!!



RACE PREP RACING MOTORS

852 S. HWY. 89

CHINO VALLEY, AZ 86323

(602) 636-1955 FAX (602) 636-1956

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd, Wilton, CT 06897-3035. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



Brush and Spring Tuning for Stock and Modified Motors

WHAT'S THE BEST brush and spring combination to use in your stock or modified motor? Now, there's a question that will get you as many answers as there are racers at the track on any given day!

Everyone seems to have his own secret combination that produces mega-horsepower: heavy springs, light springs, soft brushes, hard brushes, fancy brush cuts; you name it, and someone swears by it!

Talk to folks who drive in various classes, e.g., on-road, off-road, oval and 1/2 scale, and you'll really wonder what to try next. The motors in those cars and trucks all use different gearing, draw different loads, are used to

run heats of different lengths and, in some cases, use different batteries, so motor setups vary considerably. Ask around at the local school lot or backyard track, and you'll find yet another group of creative combinations that are used by the run-for-fun crowd.

To make things even more confusing, new brush cuts and compounds are introduced every month! Last week's hot combination might be old news today, especially when you're talking about the newly developed laydown brush-hood technology. Oval and off-road racers, in particular, seem to be on the cutting edge of this experimentation. Maybe that's because they go through so many motors!

Surely, I thought, someone must have summarized all the brush cuts, compounds, spring types and tensions, and produced a cross-reference suggesting the combinations best suited to each application. By searching high and low throughout the country, I amassed information from the larger manufac-

Editor's note: although Dr. Doug is quite the fanatic and dynos motors more than 1,000 times to give you the best info about brush and spring selection, please keep in mind that a motor will react differently on a dyno than on a track. Results will also vary according to the motor's condition (wear and tear). So keep in mind that the following information is a benchmark for most motor applications, and the best bet is to do some testing of your own.

MANUFACTURER	STOCK #/ NAME	LAYDOWN	VERTICAL	TYPE	SILVER	COMMENTS	EYELET?
S&K	IM3051	•		full			n
S&K	IM3059	•		venturi		cross-drilled	n
CRC	6017	•		soft		full	n
CRC	6007	•		venturi		vert slot	n
CRC	6038	•		hollow	•		n
CRC	6037	•		hollow		soft	n
CRC	5038	•		hollow	•		n
CRC	5017	•		soft		full	n
CRC	5037	•		hollow		soft	n
CRC	5037T	•		hollow		soft, treated	n
CRC	6018	•		full	•		n
CRC	5018	•		full	•		n
CRC	5007	•		venturi		vert. slot	n
Trinity	4035	•		2/3 cut			y
Trinity	4038	•		hard		full	y
Trinity	4046	•		soft		full	y
Trinity	4065	•		full			n
Trinity	4380	•		grooved		full	y
Trinity	4381	•		full			y
Trinity	4382	•		timed	•		y
Trinity	4383	•		grooved		full	y
Trinity	4384	•		vert slot		full	y
Trinity	4385	•		vert slot		full	y
Trinity	4386	•		full		copper	y
Trinity	4444	•		full	•	soft	y
Trinity	4455	•		full			y
Trinity	4466	•		timed			y
East Coast		•		grooved			n
Point Blank		•		full			n
Trinity	4463	•		hard		full	n
BRP	7145	•		full	• 3%		n
BRP	7146	•		hollow	• 3%		n
BRP	7150	•		full	• 10%		n
BRP	7151	•		hollow	• 10%		n
BRP	7154	•		diamond	• 15%		n
BRP	7155	•		full	• 15%		n
BRP	7156	•		hollow	• 15%		n
BRP	7156-L	•		hollow	• 15%		n
BRP	7160 'DA'	•		full			y
BRP	7165 'DA II'	•		full			n
BRP	7166 'DA II'	•		hollow			n
BRP	7166-L 'DA II'	•		hollow			n
BRP	7167 'DA II'	•		diamond			n
BRP	7170	•		full		SuperStock	n
BRP	7171	•		hollow		SuperStock	n
BRP	7172	•		hollow		SuperStock	n
RACE PREP	8002	•		2/3 cut	•	soft-R	n(y=#9002)
RACE PREP	8003	•		timed	•	soft-R	n(y=#9003)
RACE PREP	8006	•		vert cut	•	hard-P	n(y=#9006)
RACE PREP	8007	•		2/3 cut	•	hard-P	n(y=#9007)
RACE PREP	9000	•		full	•	soft-R	n(y=#9001)
RACE PREP	9004	•		full	•	hard-P	n(y=#9005)
RACE PREP	9008	•		full	•	soft-R	n(y=#9009)
Reedy	733	•		full		clipper on road	n
Reedy	734	•		full		clipper off road	n
Reedy	737	•		full		off road	n
Reedy	760	•		full		off road	n
Reedy	761	•		full		on road	n
Reedy	762	•		full		comp on road	n
Reedy	763	•		full		clipper on road	n
Reedy	764	•		full		clipper off road	n
Race Prep	7000	•		H cut	•	R=soft	n(y=#7001)
Extreme	3040	•		full		HC-80 Pro	n
Extreme	3040LD	•		full		HC-80 ProLaydown	n



turers that described their own products. Much of it was informative and very well-written.

That's great for folks who use a single brand of merchandise. Many of us, however, find that our hobby shop or race track has several brands of brushes, but not the one

your current application?

In an effort to clear up some of the confusion, I took on the task of testing combinations of every brush and spring I could get my hands on. I restricted my tests to major national brands that readers could probably find in their hobby shop or through a mail-order source. Even so, that added up to more than 60 brushes and 30 sets of springs!

DYNO-MITE!

The test bench in my secret underground laboratory includes an RSR computer-controlled dynamometer to compare motor-tuning results and a Class Recreational Products* Spring Thing that has been modified with a larger readout scale to compare brush tensions. The original Spring Thing works just fine but, for this test, I wanted something that would distinguish between readings of 2.4, 2.5 and 2.6 and do it accurately. I could have used any of several excellent and currently available dynamometers, including the TurboDyno from Competition Electronics*, LavCo's* Pro Dyno, or Tekin's* Motor Dyno. Unfortunately, none of them provides the "save-to-disk" capability that makes the RSR so convenient when there's such a massive amount of test information. It's really too bad that RSR has stopped manufacturing this fine unit.

I also needed some stock and modified motors to use as test beds, and I knew that they'd be trashed by the end of the test. After all, we're talking about more than 1,000 dyno runs here, and each motor would be torn down and inspected

afterward to compare commutator wear. In the interests of research, Kwang Ko, the owner of Hobby Hangar Speedway in Chantilly, VA, donated eight brand-new, stock Trinity* motors. Since his indoor, banked, carpet oval is one of the fastest on the East Coast, racers there are always looking for ways to get an edge on the competition. Some of the information and tips I'm going to pass along to you came straight from the guys who consistently set fast lap times or hold the track records there.

Modified motors respond to brush and spring tuning differently from stock motors. The brush cut, compound and spring that you use in your killer stock oval motor would probably make a real dog out of that new 12-turn triple you just bought for 1/2-scale racing. I expected to put a lot of dyno runs on a modified motor as well, so I turned to Kim at Elite Speed Products* for assistance. He set me up with one of their excellent hand-wound modifieds that's based on Trinity's EX can, and it, too, was totally worn out by the time testing had been completed.

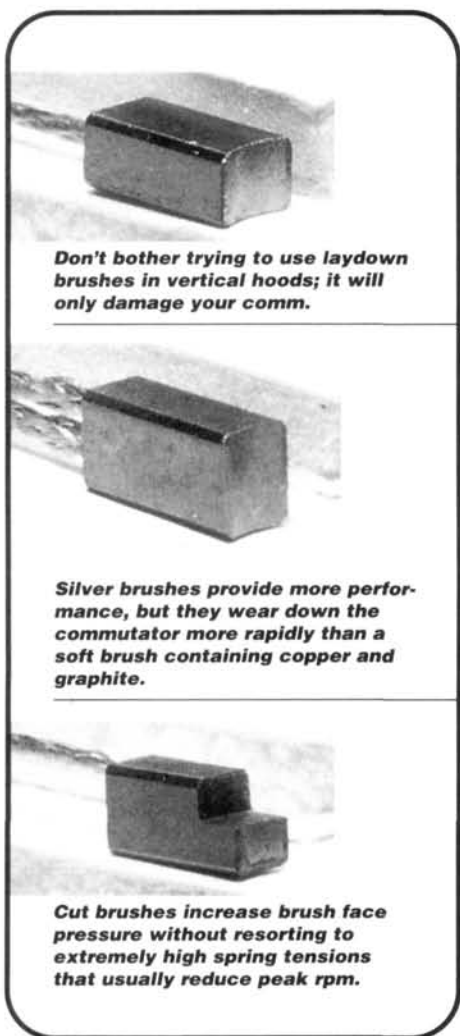
SPRING-O-RAMA

I started the project by devising a testing method to accurately compare different brands and types of spring. Almost every major manufacturer markets a line of springs with tensions that range from light to heavy; some have expanded their range into extra-lights and super heavies. As you can see on the chart, those terms mean different things to different companies.

By measuring all of the springs on the same

device, I've provided a tension comparison that cross-references part numbers and manufacturers. Now, you can move up or down as little as 1/10 of a point, or as much as a 1 1/2 points, and you'll know precisely what you're doing, even if the springs you need are sold under different brand names. Precision is a key word here, since proper spring tension is critical to getting the most out of your tuning efforts. In case you're wondering, all the tension checks were performed three times, so I'm providing you with the most accurate, consistent readings possible. You might want to copy this chart and keep it in your toolbox for future reference.

Some of these springs also have unusual designations on the chart. Stubby springs have a shorter brush-hood shaft (the end that resides in the hook on the brush hood), and they tend to snag the brush shunts less often on vertical brush hoods. Laydown springs are made with an extra bend on the brush shaft (the end that contacts the brush itself); this a feature that some motor tuners find desirable. The geometry of a laydown brush hood is considerably different from that of a vertical brush hood in that the center point of the brush in the hood is somewhat lower. The extra bend of a laydown spring properly centers the point of the brush leg on the brush. Not everyone feels that this is critical to proper tuning, but many tuners put this extra bend in the brush spring of their choice when they install it on a laydown motor. By the way, every spring listed



we're looking for. Light-, medium- and heavy-tension motor springs may be in stock, but they're made by three companies. They may even have a new brush cut or a compound that doesn't appear in the literature you have. How do you decide which to buy, and which is the best for

here will fit every stock or modified open-endbell motor that's currently available, whether it has vertical or laydown hoods.

BRUSHIN' UP

In theory, you could use vertical brushes in a laydown motor by breaking them in for a long, long time (in fact, that's what everybody had to do until more laydown brush compounds became available), but you'll wear out a commutator pretty quickly doing that. The brushes would be awfully short by the time they were properly broken in.

Forget trying to use laydown brushes in vertical hoods; I gave it a shot, and it was a total waste of time. By the time the brushes had been broken in fully, the comm was worn on the top and bottom so much that it had an hourglass shape, and it had to be re-cut. Most manufacturers offer their compounds in laydown and vertical formats anyway, so you should have no problem finding exactly what you need.

Brushes are made by molding a combination of copper, graphite and silver (along with trace additives or lubricants that help the face of the brush ride easily over the surface of the commutator) under high pressure. The brush wires, called "shunts," are usually molded into the brush at this time. The ingredients, the size of the composite particles (called "granules") and the consistency of the mixture all help to determine the qualities of a particular brush compound.

- Soft brushes wear rapidly, and they typically have a higher copper/graphite content and little or no silver.

They're usually easier on the commutator surface, but they do have disadvantages in some forms of racing. Soft brushes usually have a fairly short life and, sometimes, they have to be replaced after only two or three runs.

They will often overheat or turn blue at the face, if they're run in a high-amp draw, high-rpm motor, like those used in modified 1/10-scale on-road racing, and they sometimes reduce peak motor rpm. They do give more bottom-end power, however, and many off-road racers like them primarily for that reason. Some oval racers will use soft brushes in handout stock motors to increase torque coming out of turns, but the pan-car crowd probably use them more often in roadcourse than oval racing.

- Hard brushes typically have a higher silver content—some, 15 percent or more. Though the brush lasts a long time and gives excellent results in some forms of racing, these compounds can be very hard on the commutator. Oval guys use silver brushes all the time.

That's why they also tend to re-cut their stock motor comms every week or two. Newly introduced silver-brush material mixes, such as Extreme's* HC-80 and Trinity's Sportsman Silver seem to be a little easier on the comm but, generally speaking, the higher the silver content, the shorter the comm life. These brushes are best for high-rpm, no-holds-barred applications like modified motors and high-timing oval stocks. If you're less concerned about the life of your motor and more concerned about winning your Main at a regional race, silvers are where it's at.

SPRING COMPARISON CHART

Manufacturer	Stock #/Name	Tension Rating	Remarks
BRP	7185 LIGHT	1	■
Trinity	4032S Light	1.3	■ 90 degree
Race Prep	9011	1.4	■
Reedy	741	1.5	■ on road
Trinity	4005 Brush/Spring	1.6	■
S&K	IM3003StkMed	1.8	■
S&K	IM3002Heavy Mod	2	■
S&K	IM3004MedMod	2	■
BRP	7186 Medium	2	■
Reedy	740	2	■ off road
Reedy	742	2	■ sonic laydown
Trinity	OEM MonStk Jr2	2.1	■
Point Blank	OEM MonStk Jr2	2.1	■ stubby
BRP	7187 Heavy	2.25	■
Extreme	5060 Medium	2.25	■ stubby
Race Prep	9012	2.25	■
Trinity	OEM GrnMach2	2.4	■ stubby
Race Prep	9013	2.4	■
Point Blank	OEM GrnMach2	2.5	■ stubby
EastCoast	OEM MonStk Jr2	2.5	■
EastCoast	OEM GrnMach2	2.5	■
Trinity	OEM MonStk Jr	2.5	■
Trinity	4387 Laydown	2.5	■ stubby
Trinity	4028S Medium	2.5	■
Race Prep	9014	2.6	■
Class	7053 laydown kit	2.6	■
BRP	7188 Super Heavy	2.6	■
S&K	IM3001StkHeavy	2.7	■
Trinity	4033S Heavy	2.8	■
BRP	7189 Extra Super Hvy	3	■
Trinity	4492 Extra Hvy	3	■
Race Prep	9016	3	■

CUTTIN' UP

Many motor tuners cut, shape or drill the face of a brush. This practice increases brush-face pressure without your having to resort to the extremely high spring tensions that usually reduce peak rpm. Think of it as the differ-



ence between standing on both feet and standing on just the toes of one foot. You aren't any heavier, but I bet you wouldn't want to stand on your toes that way for very long because all your weight is on a smaller area.

I've seen and tested both hard and soft brushes that have been subjected to the most bizarre forms of sculpture. Diamonds, squares, holes, letters—you name it—and it has probably been tried somewhere.

WHAT WORKS AND WHAT DOESN'T?

My testing indicated that simply reducing the height of the brush face was the safest and most consistent brush-cutting method when dealing with soft brush com-

pounds. Other methods, such as cutting a diamond-shape face or a cavity, left too little material remaining, and the brush would crumble or "chunk" when used. With a soft brush, start by cutting the top a little at a time, i.e., the width of a cutting wheel on a Dremel tool or the thickness of a nail file, until you get the effect you desire. The result should be reduced amp draw without lowering torque or peak rpm. You'll also get longer commutator life if you install brushes with one cut side facing

What one company calls a light spring, another might call medium. Check the spring chart to see what tension best suits your application.

(Continued on page 208)



Novak duster

IN JULY '94, I reviewed Novak's* Rooster—a premium, reversing, electronic speed controller (ESC) that was incredibly easy to install and set up because it could be matched to the transmitter with Novak's One-Touch Set-Up™. I commented that the One-Touch™ was a great idea and that I hoped that Novak would soon offer other ESCs with it. Well they've now introduced the duster (Novak spells it with a lower-case "d").

The duster is classed as a sport model (no reverse), and it will handle stock and modified motors. I suspected that it had the heart of a competition-grade racing ESC because Novak uses Megafets to handle the current and lists its "on" resistance as an incredibly low 0.003 ohm.

DUSTER DELIBERATIONS

Every Novak ESC I've inspected has been of the highest quality, and the duster is no exception. The parts that handle high power, e.g., the FETs, have conventional leads that pass through the board and are connected to massive copper runs. The duster is definitely well-built and should provide many seasons of trouble-free service.

• **Resistance test.** Low resistance is very important in an ESC intended for high-performance cars. Zero resistance would be ideal but all electronic devices (except superconductors) have some resistance.

Resistance robs the motor of power. If an

ESC's resistance is 0.025 ohm (fairly typical),

at 20 amps, the controller would

rob the motor of 0.5 volt. Considering that a 6-cell battery typically delivers 7 volts under load, 0.5 volt would be a 7 percent loss of power. Even worse, the FETs would soon be overheated.

With 12 amps of current flowing, I measure the voltage drop across the ESC and then calculate its "on" resistance by dividing the measured voltage drop by 12. I measure resistance twice—along the full length of the motor wires and battery wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's resistance as it comes from the factory, and the second gives a standard reading with which I compare

ESCs. The duster looked impressive, but I wanted hard numbers!

To take these measurements, I had to match the duster to my Pit Stop radio, which is a servo tester that puts out the same pulse-width modulated signal as a receiver and allows me to bench-test servos and ESCs without turning on a transmitter and fighting with its spring-loaded trigger. As the Novak advertisement says, one touch of the duster's program button, and it was matched to my Pit Stop Radio.

• **Resistance along full length of battery and motor wires:** 0.23 volt—0.019 ohm.

• **Resistance 2 inches along the wires:** 0.07 volt—0.0058 ohm (impressive!).

This means that if the duster was handling 20 amps, it would have only a 0.11V drop—about a 1.5-percent loss of voltage to the motor (much better than a typical ESC). This also means that the duster only has to get rid of 2.2 watts of power in its heat sinks—a job they should be able to handle with cool efficiency.

• **Heat test.** I "cook" every controller I test by adjusting the resistor bank to pass 20 amps of current, jamming the throttle wide open and running the ESC for 15 minutes while it pumps a hefty 20 amps. After 15 minutes, the heat sinks were quite warm, but not hot enough to burn a finger. With a little cooling air and its low resistance, the duster should be able to handle almost any motor while staying cool, calm and collected.

• **Dead-short test.** In this test, I check to see whether an ESC could survive the heavy current it would have to withstand if a gear jammed or

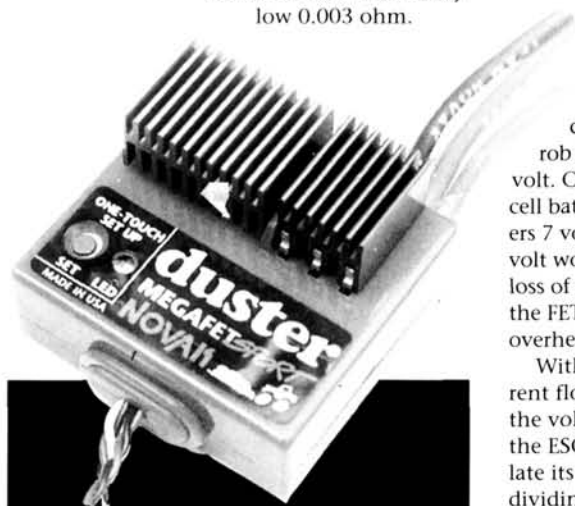
the motor fried. I jammed a short across the duster's motor leads, and the current jumped to 40 amps (the limit of my bench supply). I let the duster run for 30 seconds or so, and it didn't complain; it handled 40 amps without turning to dust.

DUSTER BUSTIN'

I was eager to test the duster in my Kyosho Sideways. Although it seemed like a waste of time—with its factory installed connectors and its One-Touch Set-Up™ what could go wrong?—I read the instruction sheet carefully. If you follow the six steps given there, you should be able to install and program the duster without a problem.

The instructions stress the importance of installing the three 0.1-microfarad capacitors across the motor—important because they bypass the radio noise that could cause glitching. Glitching will stop you from finishing first, and the voltage spikes generated by a hot wound motor can actually be large enough to damage the FETs. If this happens, your prized ESC has to go back to Novak for repair, so if you can't solder in the three capacitors, get help.

My Sideways has a large flat spot on its top deck that's ideal for mounting an ESC. The bottom of the duster's case is also flat (no screw heads to get in the way), so it was easy to mount it with double-sided tape. To ensure a good bond, I cleaned the bottom of the ESC and the top deck of the Sideways with a rag that I had moistened with motor cleaner. The motor in my Sideways already has a full set of 0.1-microfarad capacitors in place, so to complete the installation, I just had to plug



What it Has

- One-Touch Set-Up™
- Radio priority circuitry
- 7 FETs (five for forward; two for brakes)
- High-frequency motor drive
- Tamiya-style battery connectors and bullet motor connectors
- BEC
- Pulse-checking LED



in the wires. Tamiya battery connectors and bullet-style motor connectors are not suitable for racing, but my Sideways is my fun car so it has these standard connectors.

COMMENTS:

The duster is listed as a sport ESC, but it has the same low resistance as some full-blown racing models, so it runs very cool, especially if it's mounted where it gets air cooling. Its two really exciting features are One-Touch Set-Up™ and radio priority circuitry. One-Touch Set-Up™ means that it takes less than 5 seconds to match the duster to your transmitter's trigger travel. And although the instructions give the best setting for your transmitter's controls, the duster will match itself to your transmitter regardless of its settings (especially handy if you have an older transmitter that doesn't have a throttle reversing switch). The radio priority circuitry magically maintains good steering all the way to a complete battery dump, so you won't have to worry about run-aways or steering glitches when the battery starts to go soft. The duster is good for sport applications because of its ease of use and low price, and its low resistance makes it great for racing.

With the duster mounted, I had to match it to my Magnum AM radio. With the One-Touch Set-Up™ system, this took all of 5 seconds. Turn on the transmitter and the duster's power switch. With the transmitter's trigger in the neutral position, press and hold the One-Touch™ button on the duster until the LED on its top turns a solid red, then release the button. Next, advance the throttle trigger to full forward and hold it there until the LED turns green; then push the throttle to full brakes, and hold it there until the LED blinks green. Last, release the throttle trigger back to neutral, and wait until the LED turns red. And, folks, that is all there is to it.

From the first run, the duster showed it's a world-class ESC. It has high-frequency motor drive, so it's very smooth in slow and mid-ranges. Also, its very low resistance means wheel-spinning acceleration and booming top speeds. Brakes were quite strong; 180-degree stop-and-go turns were a blast. Apparently, the BEC is well-filtered because when I drove the car a long way down the

road, there was no glitching or radio interference.

During all the runs, the duster provided fast acceleration, excellent top speed, good braking and outstanding run times. Also, the heat sinks were always barely above room temperature. I expected all this because the duster has low resistance and a high-frequency motor drive.

HIGH-TECH TREATS

- Radio priority circuitry. According to the instructions, this circuit will control all the radio functions even after the battery has dumped. To test it, I drove the first battery to a complete dump—so drained that the car would barely move. I still had full control over the steering and the throttle. I did figure-8s in the driveway until the car stopped moving, and not once did the steering glitch or falter. This feature worked extremely well and will keep the steering working as you struggle to cross the finish line with a dumped battery pack.

- One-Touch Set-Up™. I flipped the reversing switch on my transmitter's throttle channel, pressed the program button and reprogrammed the duster with a push and a pull of the trigger. It again responded to every transmitter command. This is great, especially if you want to match the duster to an older, stick-style radio that doesn't have a throttle-channel-reversing switch. Next, I tried to reprogram the duster, but this time, I moved the trigger forward and then toward the brake just a little. The duster also accepted this programming, yielding a hair trigger (a slight touch of the trigger produced wide

open response). I don't think this setup is very practical, but it demonstrates the duster's flexibility.

DUSTER DECISION

I think the duster is the wave of the future in ESCs. Low resistance, high-frequency motor control and One-Touch™ programming all combine to make an ESC that's hard to beat.

In the past, Novak has produced some of the strongest sport controllers on the market; for example, their 410-M5 had the same set of FETs as the 410-M1 and the 410-M1c, the only major difference being the size of the motor wires and battery wires (the 410-M1/410-M1c uses monster wire) and that the 410-M1/410-M1c comes without battery and motor connectors. The duster continues this tradition. Its resistance is listed as being identical to that of the 410-M1/410-M1c. And it carries a sport-model price tag—mail order, as little as \$69.95—so it's an outstanding buy.

The duster should be able to handle almost any motor—mild stock or hot wound modified. (The Tamiya-style battery connectors and the bullet motor connectors aren't up to handling modified motors. Note the difference between the two resistance readings—along the full length of the wires and 2 inches along them: 0.0058 ohm and 0.019 ohm, respectively—roughly a 3:1 difference with the connectors attached.)

With its full set of connectors and ease of setup,

Novak duster

DIMENSIONS

Height (with heat sinks)1.4 in.
Width1.65 in.
Length1.7 in.
Weight (with heat sinks) ..2.0 oz.

TUNING

Access to controlsExcellent
Ease of adjustmentExcellent

LIST PRICE\$129
Warranty90 days

ELECTRICAL (Mfr.'s specs)

Max. voltage10 cells
Min. voltage4 cells
Max. current.....Unlisted
Continuous current250 amps
Resistance0.0030 ohm

TEST PARAMETERS

Voltage6 volts
Current.....12 amps

Voltage drop:

—along length of wires 0.23 volt
—2 in. along wires0.07 volt

Resistance*:

—to end of wires0.019 ohm
—2 in. along wires0.0058 ohm

BEC output,
6-cell battery5.64 volts

*Resistance =

Voltage drop ÷ Current

the duster is excellent for newcomers to the hobby, and it will really boost performance (compared with the mechanical controller that came with the car).

The duster will also suit serious racers, who should be able to eliminate the power-robbing connectors by hard-wiring and installing high-grade battery connectors such as Deans* Ultra Plug or those from Litespeed*. (Anyone who's really serious should also hard-wire his batteries.)

The bottom line is that if you're looking for a sport-style ESC or a darn good racing controller for a reasonable price, the duster is the right choice. I think it's destined to be a classic.

*Addresses are listed alphabetically in the Index of Manufacturers on page 232. ■



GETTING STARTED

WHEN MY 13-year-old next-door neighbor, David, came to me for advice on what car to buy, I suddenly remembered what it was like to get started: I was excited and confused. A lot of agony might have been avoided, if someone had asked me the following two questions:

- How much money do you want to spend?
- Do you want an off-road car or an on-road car?

The answers to these simple but vital questions are what will determine the type of car you should buy.

Let's use my friend David as an example. He wanted an off-road car that he could fool around with in his yard and on the track that I have in my backyard. I own an RC10 Team Car and absolutely love it, so I suggested he buy an RC10. I explained to him that it's a solid, well-built car that can easily be updated. I also mentioned that our local hobby shop carries every spare part for the RC10. This is important. It makes no sense to buy a car if spare parts are hard to find. David needed everything to get started, so a Team Car was

out of the question because of cost.

We found a package deal that included an RC10CE with an Airtronics* pistol radio, a Reedy* motor, a 1500mAh battery pack, a mechanical speed control and a Pro-Tech* charger. The equipment was of good quality, and it was within David's price range. Now he has a car that he can easily upgrade as his skills improve. Remember beginners, you don't need ultra-pushed SCRs, ball bearings and a peak charger that also rematches packs.

David and his dad are brand-new to R/C. My car was the first R/C car that they had ever seen. Naturally, they had lots of questions. This month, I'll answer five; look for the next five in the February '94 issue.

—Brian Leslie

What kind of batteries should I get?

I recommend SCR batteries; they're the most reliable and the easiest to maintain. SCR cells are generally more durable, and they can take repeated charges in the same day. The 1400mAh size is good for stock and modified motors.

A few last words to beginners: follow the building instructions exactly. The people who produce these cars have been designing and racing them for many years. Their experience is vast, and they've tried nearly every conceivable setup combination. The setup in the instruction manual is the best, so use it. After you've gained some experience, then, maybe, you can fool with the setup. Until then, leave well enough alone, and follow the instructions. Most of all, have fun!



Attention novices!

Are you having trouble getting answers to your R/C questions? Are you afraid that other racers might laugh at you? We won't! Ask us about motors, driving, building your first car, or how to ask for help at your hobby shop. Send your questions to: Getting Started, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. Each month, we'll choose a question and answer it in depth, so you won't be left in the dark.

Beginners' Dictionary

A-arm (or suspension arm)—Hinged suspension component that connects the chassis to the wheel.

A-Main—After qualifying races, the drivers are separated by their lap numbers and times. The top 10 qualifiers race in the A-Main.

AC—alternating current. A wall plug in your house puts out 110 volts of alternating current.

Ackerman effect—A steering-geometry design that allows the inside wheel to turn more than the outside wheel.

After-market—High-performance parts that replace stock items.

Air/fuel mixture—The amount of air and fuel used for combustion

Airbrush—A spray-painting method that uses compressed air.

Allen wrench (or hex wrench)—A wrench with a hex-shaped tip that's used on hex-head bolts or screws. Wrenches come in metric and standard sizes.

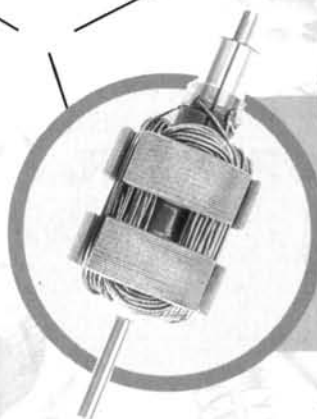
Arcing—Electrical sparks are created at the motor's brush and commutator contact point. Arcing is normal, but it increases when the motor becomes dirty.

Axle—A supporting shaft or member upon which a wheel or wheels revolve.



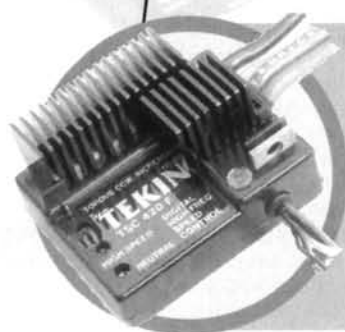
Should I buy an electric car or a gas car?

...Generally speaking, an electric car is easier for beginners. They're not as messy or as noisy as gas cars, and they're easier to control. On the other hand, gas cars are faster, and their run time isn't limited to a battery pack. With gas, you just refill the tank and go, but for a beginner, electric might be the safer bet.



What is an armature?

An armature is the part of an electric motor that contains the winding that provides the rotational force to move the car. Your pinion gear attaches to the end of the armature shaft. The battery supplies power to the speed control, which supplies power to the brushes, which supplies power to the armature...the leg bone's connected to the ankle bone!



What's the difference between an electric speed control and a regular (mechanical) speed control?

With a mechanical speed control, a wiper arm comes in contact with a wire-wound resistor. As the throttle servo moves the wiper arm across the resistor, the resistance changes according to the amount of current flow to the motor. When current is restricted, it dissipates as heat through the resistor. Heat loss is what makes a mechanical speed control inefficient. An electronic speed control, or ESC, is the device that usually replaces the mechanical speed control when people start to modify their cars or trucks. The ESC uses electronic circuitry to feed power from your battery to the motor with much greater efficiency than its mechanical counterpart. Run times will be longer with an ESC, and throttle control will be smoother.

How do I tell the difference between a good solder joint and a bad one?

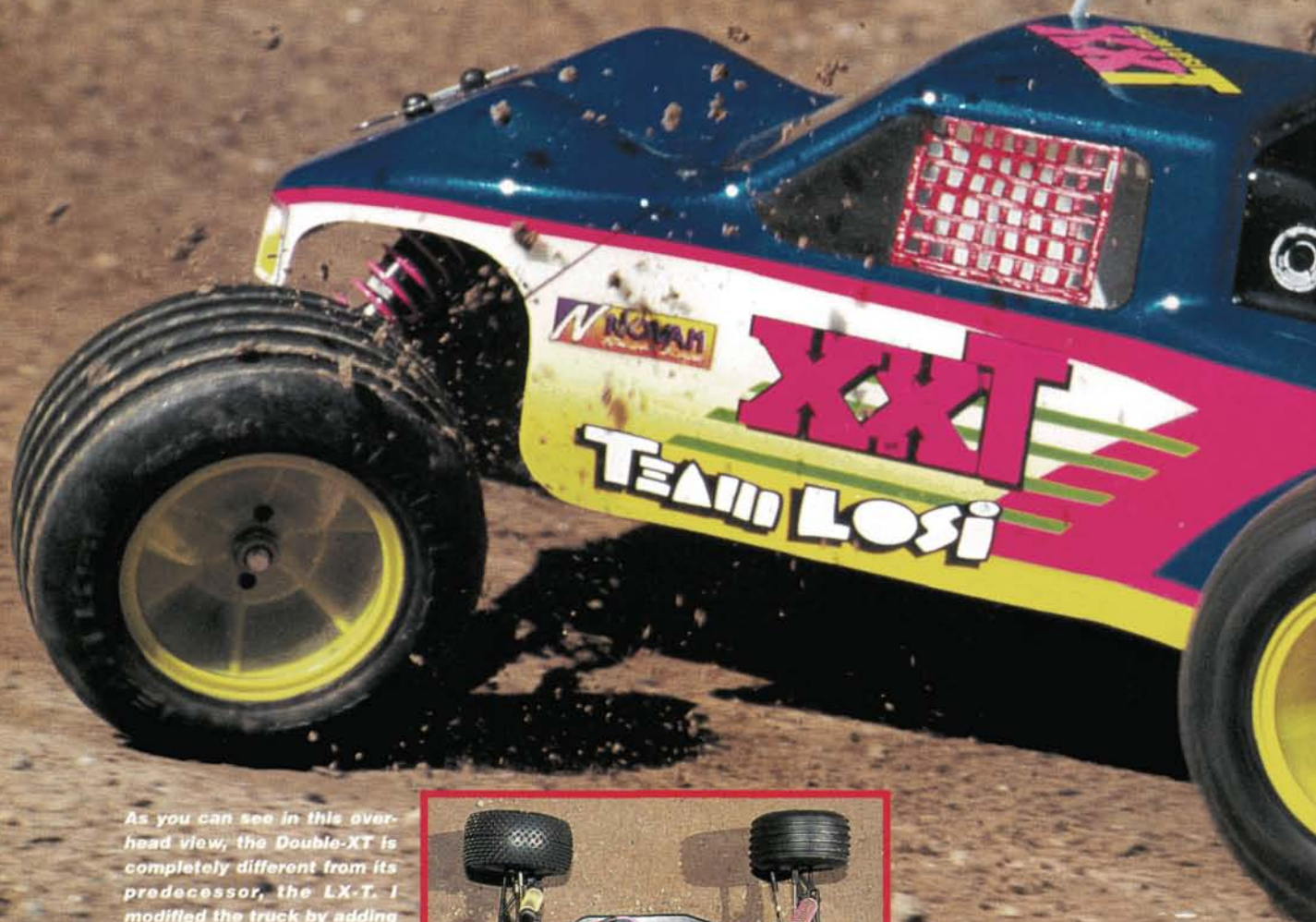
A good solder joint means that the part being soldered (we'll use a wire for an example) doesn't move or flex at the solder joint. Also, the solder joint should be shiny and bright, not gray and dull. A dull gray solder joint is called a "cold solder joint," and cold solder joints can break at any time. Even though the wire feels as if it's making a good contact, it may not be with a cold solder joint. Heat is the key to good solder joints. A 40W iron is a good size. Place the iron on the part to be soldered, and feed a small amount of solder to the tip of the iron. Once the solder starts to flow, feed a little more to the tip, but not too much. A good solder joint doesn't require large amounts of solder.

Once the area has been covered in a shiny flow of solder, remove the iron. Don't overheat batteries or motors by leaving the iron on them longer than necessary. Batteries require a lot of heat when you solder them, so make sure you have a hot iron.

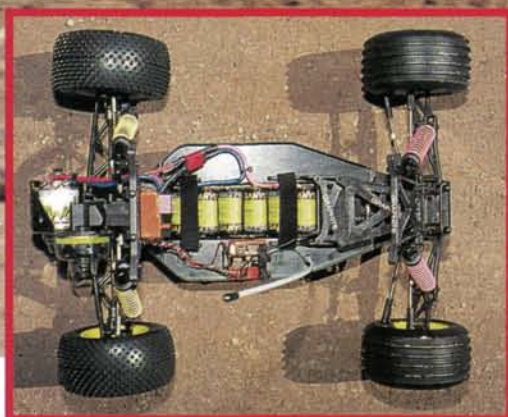


The next generation of stadium truck?

by JOHN HOWELL



As you can see in this overhead view, the Double-XT is completely different from its predecessor, the LX-T. I modified the truck by adding some of Losi's after-market graphite parts.



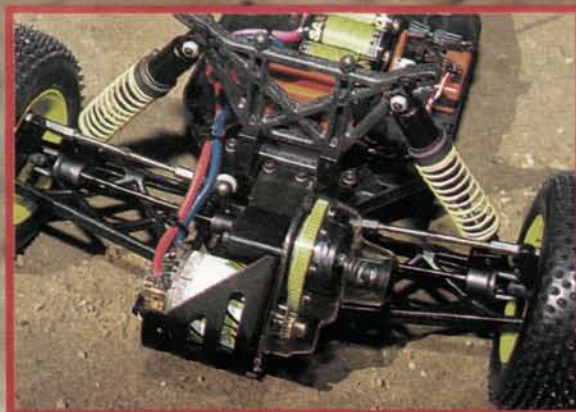
TEAM LOSI Double-XT

I'm gonna go out on a limb here and make a bold prediction: Team Losi's* new Double-XT truck will win a lot of races; let me repeat that...a lot of races. Well, maybe that's not such a bold prediction, because the truck is based on the already proven, win-

ning geometry of Losi's Double-X buggy. So, let's take a look at what makes this trick truck tick.

KIT FEATURES

Basically, the Double-XT has almost all the hot features of its buggy brother, the Double-X. Most important, it carries over its modular design. As with the buggy, you can easily remove the entire rear end of the truck (suspension intact) by removing six screws, or remove only the transmission by removing



Check out the long suspension arms! Losi's Hydra Drive unit comes with the kit. Notice that I replaced the stock Pink rear springs with a set of Losi's new Yellow springs, which perform well on slippery tracks.

I was told that mounting the ESC on the rear shock tower and not on the side of the chassis is the hot setup. I checked out Novak's new Hammer Pro ESC, and I was very pleased with its performance.



The Double-XT features a swing-away front end that allows you easy access to the steering servo and steering bellcranks. Pink springs are standard at each corner.



four screws.

The truck's swing-away front-end design allows the user easy access to the steering assembly and the steering servo. The front end features a 30-degree kick-up angle that provides optimum handling. Camber and front geometry are totally adjustable.

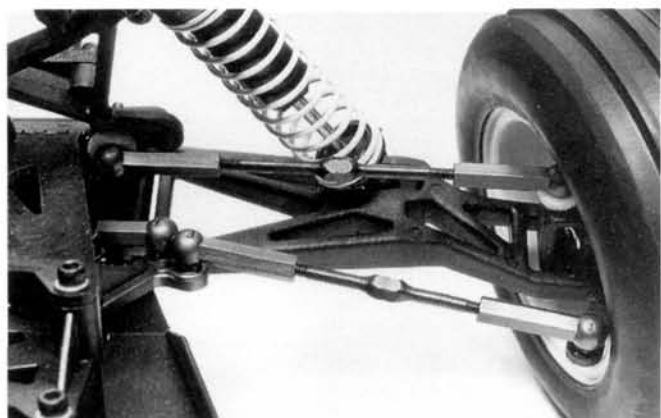
The truck's "Losi-G" (low center of gravity) tunnel chassis is $\frac{3}{8}$

inch longer than the Double-X chassis, and it features the same raised sides, which benefit the vehicle in rough terrain and during chassis-roll situations; it's almost identical to the Double-X chassis.

Running from front to rear in the low channel in the center of the chassis is the battery tray. It's slightly longer than a typical battery pack, so you have the option of sliding the battery forward to increase steering, or more toward the rear, which benefits rear traction.

The truck has long front and rear suspension arms and Losi's

PHOTOS BY JOHN HOWELL



The truck's front suspension arms are really long. New offset wheels allow the use of these long arms.

Hard Body hard-anodized aluminum shocks. The pivot support, which is molded into the arm mounts, gives the arms 4 degrees of anti-squat; toe-in is provided by the rear hub carriers—3.5 degrees per side.

The silky-smooth Double-X tranny (the truck version has a ratio of 2.61:1) comes with the kit. A redesigned case gives it a slightly lower center of gravity. The Hydra Drive unit comes standard, as does an 88-tooth spur gear.

Gold compound Step Pins grab rear traction, while a set of HT Ribbed front tires handles the steering duties. Team Losi opted for the

harder-compound front tires because they last longer and make driving easier. New offset front wheels compensate for the truck's wide front stance.

The all-new body was designed on Losi's CAD computer. All the truck's parameters were entered in the computer (shock-tower height, suspension range for tire clear-

ance, etc.) so they were able to design a body that takes up only the minimum area necessary to cover all the components properly.



The truck's front end features some very cool items: a steering bellcrank with a built-in servo-saver system; a very rigid, molded front shock tower; and a very rigid upper front brace.

• **The Double-X^T is extremely easy to work on. Thanks to its modular design, maintenance chores seem less like chores. Time spent wrenching on your truck is cut down considerably.**

• **The truck's parts are of the highest quality. Is it possible that Losi's molding capabilities are getting even better than they've been? I wasn't sure it could get better.**

• **The new body is a definite eye-catcher.**

• **It drives and handles much better than its predecessor.**

• **The instruction manual comes with easy, detailed directions, a glossary, and comprehensive exploded-view illustrations. It's topnotch.**

DISLIKES



• None!

LIKES



THINGS YOU'LL NEED

To get your Double-X^T up and running, you'll need:

- 2-channel radio system
- relatively high-speed/high-torque steering servo
- ESC • motor
- battery pack • battery charger

TEAM LOSI DOUBLE-X^T

Scale 1/10
List price \$349.95

DIMENSIONS

Overall length 15.5 in.
Wheelbase 11 in.
Front width 12 in.
Rear width 12.6 in.

WEIGHT

Gross (ready to run) 4 lb., 2 oz.

CHASSIS

Type Three-piece modular
Material Molded composite—"Stiffezell"

DRIVE TRAIN

Type Sealed gear drive (2.61:1 reduction)
Primary Pinion/spur (88-tooth spur included)
Transmission 3-gear Double-X tranny
Differential Racing ball diff
Slipper clutch Friction w/Hydra Drive
Bearings/bushings Sealed ball bearings

SUSPENSION (F/R)

Type Independent
A-arm w/adjustable camber link
Damping Oil-filled, coil-over shocks

WHEELS

Front-Type One-piece plastic
Dimensions (DxW) 2.2x2 in.
Rear-Type One-piece plastic
Dimensions (DxW) 2.2x2 in.

TIRES

Front HT ribbed
Rear Gold-compound step-pins

I received one of the first Double-XTs to come off the assembly line, and it came to me built, so I don't have any "from the ground up" building advice for you. I did, however, replace some of the stock components with Team Losi's after-market graphite composite pieces. In 40 minutes, I had the truck massively torn down and rebuilt with the new pieces installed, and I had no trouble at all.

On talking to Team Losi's Jack Johnson, I learned that it took one of their team drivers only a little over three hours to complete a Double-XT kit, whereas it would usually take him anywhere from five to six hours to build an LX-T (and I don't doubt it after seeing how quickly and easily I replaced all those parts on my truck).

As for setup, Jack passed along some hot tips:

- A new front spindle-carrier design makes front camber-link adjustment quick and easy to deal with. The outside camber mount was placed on the top of the spindle carrier. Now, camber-link locations are easily changed by adding or removing the small ball-stud washers from underneath the ball stud. This changes the truck's roll center and handling characteristics. Most of the team drivers put two of the ball-stud washers under the outside ball; the inside is left in the standard stock location. This makes the truck drive more smoothly.

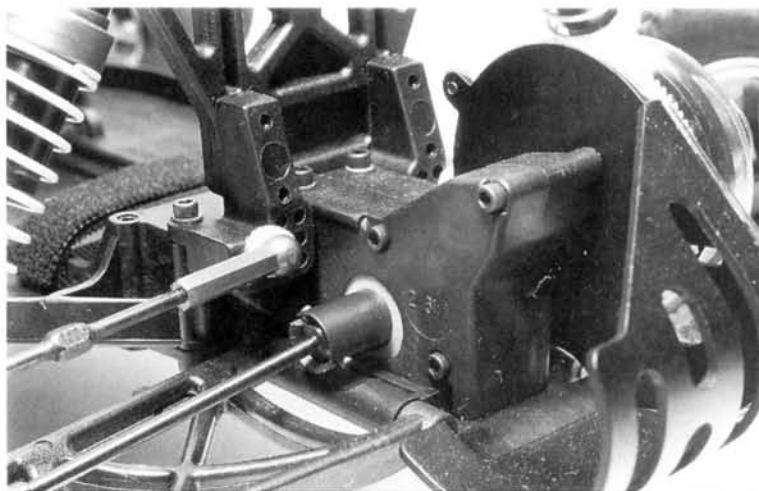
- In the front shocks, most of the drivers still use the standard pistons and oil as well as the standard Pink spring. The shock is left mounted in the stock positions on the top and bottom.

- In the rear, many drivers move the rear camber link to the no. 6 position in the bulkhead and the no. 3 position in the hub. (The camber link ends up being the same length as when it's in the stock position.) This position allows the truck to handle similarly to how it would if the rear camber link were in the stock location, but it gives it slightly more traction on slick track surfaces.

- The rear shock is mounted in the stock position in the arm, but most drivers move the top of it outward one hole. The standard rear piston and oil setup is just slightly stiff for some conditions. Jack says that either the pistons can be changed by drilling two holes out to position no. 55, or you can use 35WT oil (or mix 30WT and 25WT oil to obtain a "27WT" oil) while leaving the standard piston in place.

- For slippery tracks, some of the drivers use the 2.0 Yellow rear spring now offered by Team Losi. Many still use the standard Pink spring, though; it's a matter of preference.

- Almost all the team drivers use the standard no. 4 rear pivot support and stock rear hubs. If traction is extremely high, they'll switch to the 2.5-degree rear hubs to free up the rear end a little.



The Double-XT comes with a Double-X tranny that has a newly reconfigured case. The tranny's ratio is 2.61:1.

TEST GEAR

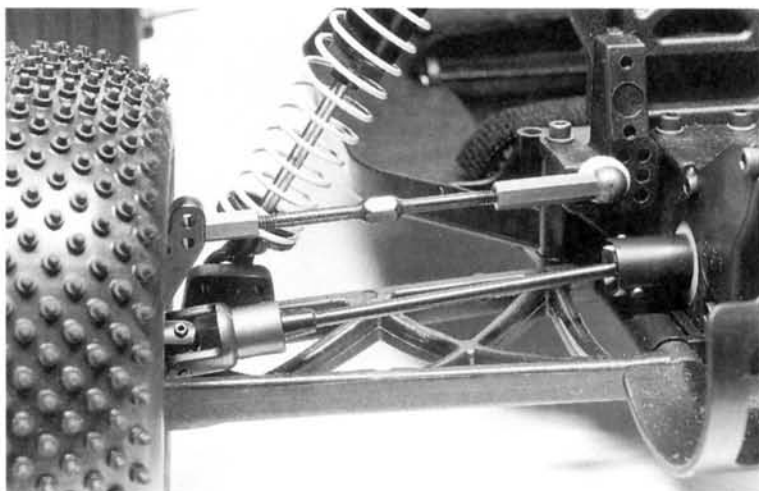
To test the Double-XT, I used my Futaba* PCM radio and a Novak* NER FM 75mHz receiver. Such a cool, new truck deserves an equally cool, new speed control, so I chose Novak's new Hammer Pro ESC. An Airtronics* 94152 servo handles the steering; and a Trinity* Kinwald Hard Ones 20-tooth pinion gear gets the spur a spinnin'. A Trinity Kinwald Series, 12-turn, double modified motor and a 6-cell Trinity Race•Tech battery pack soldered in with Trinity's new Lennon Lugs battery bars provide the get-up-and-go power. A set of Deans Ultra Plug connectors connects the battery and ESC, and topping off the package is the stock body done up by body painter extraordinaire, Scot Bich of Bich'n Bodies*. Afterwards, I added

a set of Lunsford Racing* titanium turnbuckles and hinge pins as well as Losi's graphite parts.

PERFORMANCE

I'm sure you have the big question on your mind: *if you plop down an equally equipped LX-T and Double-XT onto a track, which would win?* Well, after putting in time with both machines, I can comfortably say the Double-XT...that is, unless Brian Kinwald is driving the LX-T and I'm behind the wheel of the Double-XT! Seriously though, because of the truck's consistency on the track, most people who have a lot of experience driving an LX-T will find that their lap times will drop slightly when driving a Double-XT.

I took the truck to a local track for some testing, and I quickly



Are these rear suspension arms a mile long, or am I just crazy? Easily adjustable turnbuckles all the way around come standard, as do these trick universals.



Factory Options

Even though it's a relatively new vehicle, quite a few factory options are already available. Of course, there are a ton of different compound and tread possibilities in Team Losi's Naturals line of tires. The newest tire in that family is the low-profile front tire; available in Gold and HT compounds, this tire enhances steering and front-end stability.

Also available for the Double-XT is a full line-up of graphite composite parts, such as front and rear suspension arms, chassis (with upper brace and chassis brace) and front and rear shock towers.

Rounding out the list is an aluminum top shaft that's lighter, so it reduces the transmission's low rotating mass.

THE COMPETITION

VEHICLE	DOUBLE-XT	RC10T	SRT	STORM 2000
Wheelbase	11 in.	11.375 in.	11.375 in.	11.3 in.
Front width	12 in.	12.375 in.	12.375 in.	12.25 in.
Rear width	12.6 in.	12.5 in.	12.375 in.	12.25 in.
Weight (RTR)	4 lb., 2 oz.	3 lbs. 9.5 oz.	4 lb.	3lb., 13oz.
Chassis material.....	Siffzell composite	Aluminum	Graphite/ fiberglass	Fiberglass
Slipper	Hydra Drive	Friction Slipper	Friction Slipper	Friction slipper
List price	\$349.95	\$335	\$335	\$399
Find For*	\$190	\$170	\$175	\$259
Reviewed	1/95	8/91	Not yet	10/94

* Estimated average

found that the Double-XT is just a better overall truck: it handles better in the rough; it turns on a dime; and it has a much better in-flight attitude than the LX-T. It attacks gnarly bumps, but stays firmly planted. You really have to push it or screw up to get it onto its lid.

The Double-XT is by far the most technologically advanced stadium truck on the market. It offers the competitor a very

straightforward, easy design to work on—a definite plus—while being highly “tunable.” As of this writing, Team Losi's Brian Kinwald has already captured the ROAR and NORRCA National titles with his truck. I don't believe the winning streak has yet come to an end....

*Addresses are listed alphabetically in the Index of Manufacturers on page 232.

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MRC MT-10M

by John Howell



NOT TOO long ago, I took a trip down to MRC's* facility in Edison, NJ, to sneak a peek at the company's newest creations: the 1/10-scale MT-10S stadium truck and the MT-10M monster truck. The MT-10S is for those who like the look and feel of a stadium truck; the MT-10M is targeted at those who want a sporty truck they can bash around in their backyards, but, like the MT-10S, it's fully upgradable. MRC's major goal with these units was to produce trucks that would be as reliable as their World Scale compadres; they wanted the trucks to be faster out of the box than equally equipped competitors, and—most important—they wanted them to hit the hobby shop shelves at a very reasonable price.

Unfortunately, heavy rains put an abrupt stop to our test session, and we were forced to retreat into MRC's headquarters. Well, afterward, I received a MT-10M production vehicle for testing, and, now that I've had a lot of really hard-core testing time behind the wheel, I can tell you how it fared. Read on....

KIT FEATURES

Basically, the truck is very straightforward and has a relatively simple design; first-time builders should have no problems assembling it. It's being marketed as an entry-level machine, but it still comes with features that even a seasoned R/C veteran will appreciate: a composite-resin, non-flex chassis (very strong, yet light);

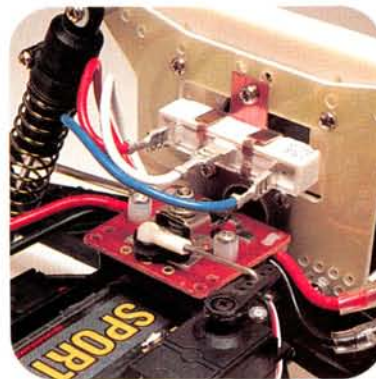


Above: plastic, oil-filled, coil-over shocks with adjustable collars provide the damping on all four corners. **Left:** to help you get your truck up and about in a timely manner, a three-step mechanical speed control comes in the kit. **Below:** A bushing-equipped Warp Speed transmission features a ball differential and slipper clutch setup.

A tough, yet reliable Monster

Well, I saw their durability first-hand when I watched our senior editor—Commander Chianelli—repeatedly launch one of the trucks off a loading dock behind MRC's warehouse—not a scratch! Afterward, we had an impromptu drag race in front of their building; the trucks were fast. And, yes, they're competitively priced.

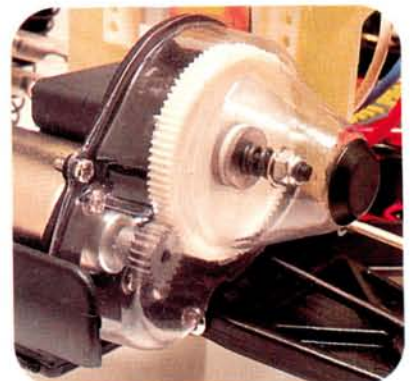
wide-track suspension arms both front and rear (they allow the MT-10M to tackle the roughest terrain); and a very smooth Warp Speed transmission with



SPECIFICATIONS

Scale	1/10
List price	N/A
DIMENSIONS	
Overall length	18.25 in.
Wheelbase	13 in.
Front width	13 in.
Rear width	12.875 in.
WEIGHT	
Gross (ready to run)	4 lb., 2 oz.
CHASSIS	
Type	Molded with upper brace
Material	Fiber reinforced nylon
DRIVE TRAIN:	
Type	Sealed gear drive
Primary	Pinion/spur

Transmission	3-gear Warp Speed tranny
Differential	Ball diff
Slipper clutch	Yes
Bearings/bushings	Bushings
SUSPENSION	
Type (f/r)	Lower A-arm w/upper link
Damping ..	Oil-filled, coil-over, plastic shock
WHEELS	
Front (type)	One-piece nylon
Dimensions (DxW)	2.2 x 1.8
Rear (type)	One-piece nylon
Dimensions (DxW)	2.2 x 1.8
TIRES	
Front	Block tread
Rear	Block tread



MRC MT-10M

48-pitch gears that has an adjustable ball differential and slipper clutch.

But that's not all. The chassis' 30-degree rake angle allows the front suspension to soak up the roughest bumps and jumps properly. Zero bump-steer in the front end's design allows greater driver control and overall predictability over the rough sections.

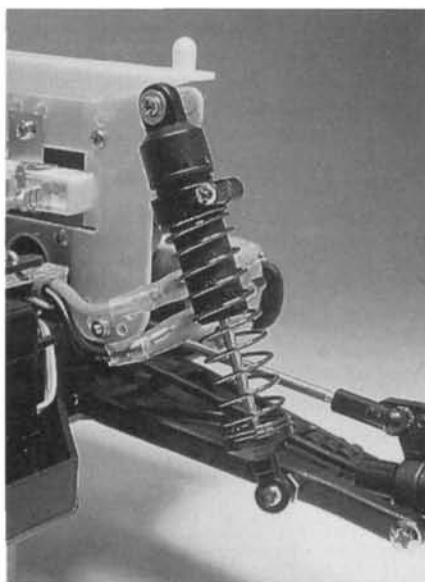
If you aren't familiar with bump-steer, here's a very abbreviated explanation: instead of the front wheel staying completely straight throughout suspension travel, bump-steer makes the front wheels either turn slightly inward or outward (toe-in, toe-out) as the suspension arm travels through its range of motion. This adversely affects handling and makes it inconsistent. The MT-10M was designed with zero bump-steer, so no matter how the suspension is compressed or rebounds, the wheel will stay straight on target.

Helping out in the suspension department is a set of oil-damped shocks with adjustable shock collars, so you can adjust spring pre-load tension and vehicle ride height.

Both front and rear shock towers come with a number of shock-mounting holes so you can alter the vehicle's handling characteristics to suit your driving style as well as the terrain and conditions.

Other hot features include: a set of aggressive, large, block-tread tires (they help the MT-10M claw its way over almost any terrain); a three-step mechanical speed control and stock motor (comes standard, so you can get up and running faster without having to shell out more bucks for an after-

market ESC and motor); and a rugged, detailed, Lexan pickup truck body.



Long-throw, oil-filled shocks out back provide smooth suspension action.

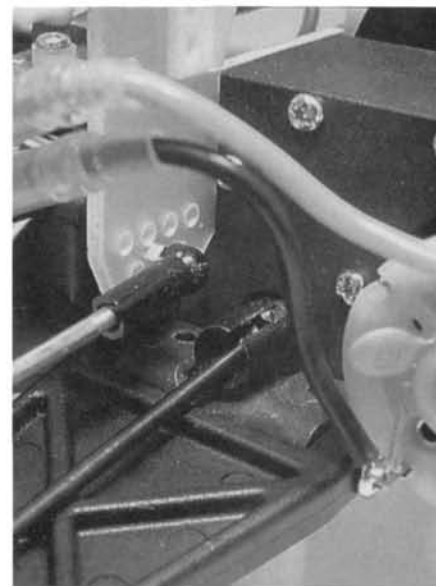
TEST GEAR

The MT-10M I've been driving is equipped with a Futaba* Magnum Jr. radio system with two S148 servos—one for steering; the other handles speed-control duties. Powering the truck is a Trinity* Zip-Pack battery pack. Other than that, the truck is completely box-stock; nothing else is needed to get it running. Topping it off is another sharp-looking Richard Muise (Motion Graphics*) original paint scheme.

PERFORMANCE

So far, I've run the truck on quite a few different surfaces. First, I drove it out on the pavement in our parking lot. Yeah; I know it's an off-road vehicle, but most R/C'ers end up running their vehicles out on the pavement. Besides, it was a good place to check out how the beast would handle in a high-traction situation. After all, it has high-profile tires, and I wanted to see whether I could get it to traction-roll. After charging up the pack, I set it down and pinned the throttle.

I'll tell you right now, the truck really does move at a pretty decent pace. Stock 540 motors aren't really known for their brutal horsepower, but in this application, one does just fine. The truck zipped around; I cut the wheel quickly from right to left to see whether I could flip it, but no go. I just couldn't get it onto its lid. The shocks and



Not only does the rear shock tower have plenty of shock-mounting holes, but it also has a ton of holes to make camber-link adjustments.

likes

- It's one tough truck! After my death-defying, curb-slamming incident, I thought the MT-10M was done for the day. But it's the Timex of R/C—it takes a lickin' but it keeps on...yeah, yeah, we all know how it goes.
- The geometry works well. The front and rear suspension work rather well. The shocks (even though they're plastic) hold their own in off-road conditions.
- It's hitting the hobby shop shelves at a really good price; and, hey, there's nothing I like more than seeing a well-built, reliable machine with a low price that gives newcomers this type of performance straight out of the box.

dislikes

- From a technical standpoint, I found nothing wrong with the truck. On a personal level, I want more horsepower, but that's just me. If you're just getting started in R/C and are interested in buying this truck, it's a fine one to start with, and it will help you to hone your driving skills (initially, it's more important than going at the speed of light).
- The same goes for the three-step mechanical speed control. I'd toss it and get an electronic one, but if you're a beginner, keep the mechanical unit; it works fine. Just send me the money that you would have spent on an electronic speed control, and I'll call you and tell you how cool you are.

large tires seemed to absorb quite a bit of the chassis roll. After using a couple of battery packs, I decided to put it through its paces elsewhere.

Next up was an extremely soft, sandy area—similar to beach sand, but slightly firmer (R/C quicksand!). The area was pretty rough—little moguls all over the place that made perfect jumps. The truck handled all the rough stuff admirably, but the sand was soft and, at some points, was at a very steep angle. That's when the lack of horsepower coming from the 540 stock motor became a slight factor. The truck performed excellently on the pavement, but in the really soft sand, I found myself saying,

"Scottie, I need more power!". But, to be fair to the MT-10M, the sand was so soft that when I stepped into it, I found I needed a little more power, too.

After shaking off the sand and dirt, I immediately took the MC-10M for the third part of my test at the *ultimate* suspension-testing ground (a field filled with rocks of various sizes). Most of the time, I kept it pinned over the rocks to see how it would handle the rough stuff at speed. Well, at this place (very firm and relatively flat), the motor had an easier time, and I got to see how the suspension reacted when the truck was really moving and how the zero-bump-steer front end performed.

The truck is very well-planted—very stable. It bounced a little over some of the bigger obstacles, but a slightly heavier shock oil took care of that.

When I had finished running it at the "Rocky VI" site, I packed it up and took it home for a quick once-over to see whether I had done any damage. After inspecting it very carefully, I'm pleased to announce that everything is still in great shape.

Oh; did I forget to mention that while I was testing it in our parking lot, I *accidentally* slammed it into a curb at full honk? It made such a horrific noise that, when I went over to pick it up, I instinctively looked around to see how many pieces I had to pick up; but, no crisis! The only thing I damaged—well, maybe "damaged" is the wrong word—was the front of the body a little bit—just a scratch—but that was it. Let me tell you though, it was a way ugly crash...

Building and Setup Tips

When I received the MT-10M from MRC, it was an early production model, so it came assembled. That's why I don't have any secret building or tuning tips to pass along to you, but we'll be reviewing MRC's MT-10S stadium truck shortly and, apart from the tires and the body, it's basically the same as the MT-10M, so we'll be able to go into more detail in this section. Stay tuned....

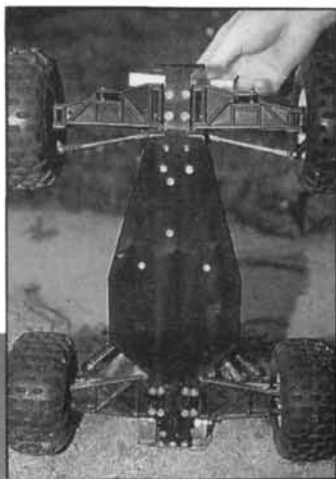
factory options

Things You'll Need

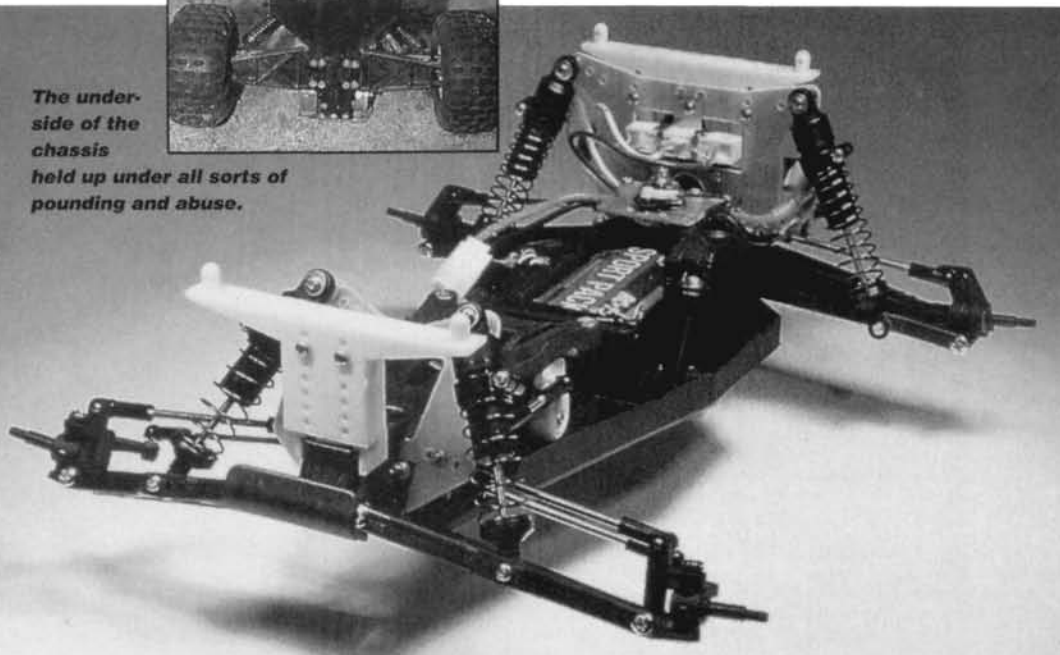
You'll need relatively few extras to get your truck ready to run:

- 2-channel radio system with two servos (one for steering; one for throttle);
- battery;
- battery charger.

- A complete set of ball bearings is available.
- The truck is currently available in ready-to-run form with a Futaba® radio system installed.



The underside of the chassis held up under all sorts of pounding and abuse.



FINAL THOUGHTS

So, what's my overall opinion of MRC's newest truck? Well, if you're interested in getting into R/C, or you know someone who

is, you can take or pass along my recommendation: check out the MT-10M. It's durable, reliable, relatively speedy right out of the box, and is generally perfect for backyard bashing. After-market parts such as an ESC, a hotter motor and any 2.2 tire can be used to soup up this beast. With all its desirable features, its well-behaved handling and its low price, I'd say that MRC has produced a definite winner.

The Competition

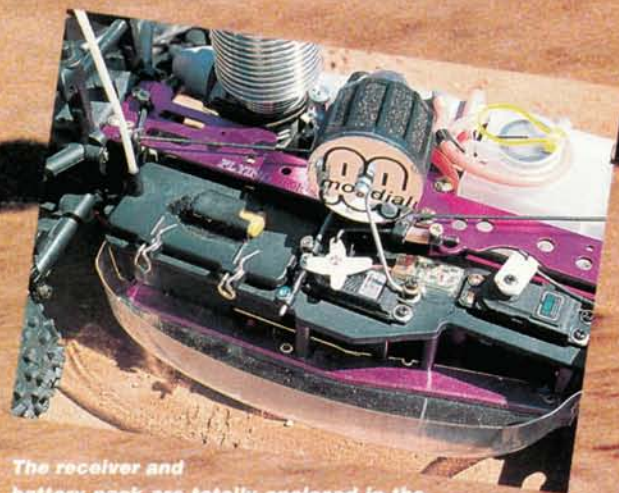
Vehicle	MRC MT 10M	Kyosho Tracker	Tamiya Super Blackfoot	Traxxas Stampede
Wheelbase	13 in.	10.8 in.	10 in.	10.875 in.
Front Width	13 in.	11.6 in.	12 in.	12.5 in.
Rear Width	12.875 in.	11.6 in.	12 in.	12.5 in.
Weight (Rtr)	4 lb., 2 oz.	3 lb., 11 oz.	5 lb.	4 lb., 12 oz.
Chassis material	Fiber-reinforced nylon	Injection-molded plastic	Molded ABS plastic	Composite nylon
Differential	Ball Diff	Bevel Gear	Bevel gear	Planetary gear
List price	N/A	\$169.99	\$179.95	\$170
Find for*	\$110	\$124.99	\$119.96	\$100
Reviewed	1/95	5/94	4/93 M&RT	To come

*Estimates

*Addresses are listed alphabetically in the Index of Manufacturers on page 232. ■



cost-effective

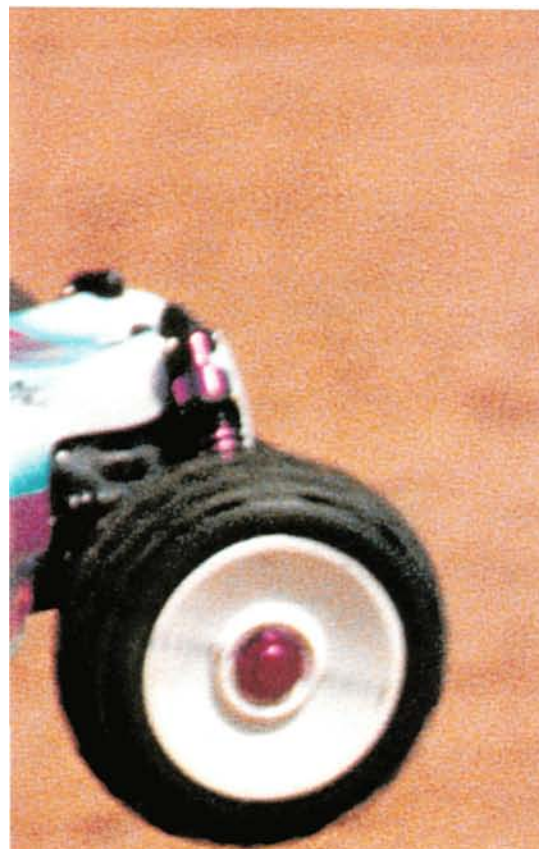


The receiver and battery pack are totally enclosed in the case below the antenna tube. Notice the wire that helps to secure the massive Mondial air filter.

competitor

FLYING POINT **Jet Probe**

by John Huber



The chassis layout on the Jet Probe is quite different from that of the Super Probe. The engine and tank are now mounted on the left side of the chassis. Notice the beefy upper front arms.

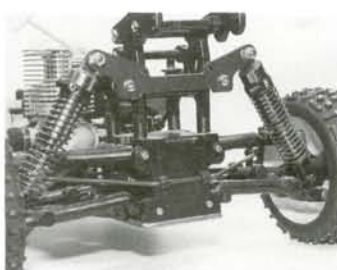


The base of the Jet Probe is this thick purple chassis. As you can see, all the hardware is countersunk under the chassis. The engine-mount bolts have beveled steel washers to keep things snag-free.

WHEN I REVIEWED the Flying Point* Super Probe in the February '94 issue, I was impressed by many of its features: the heavy-duty, in-line drive train, the dual-filter tank, the light-weight flywheel, the ball-bearing clutch bell, the dual brake shoes and the tuned pipe. There were some things I didn't like as well—mainly, the un-anodized shocks. Well, here it is a year later, and there's a new version of the Probe—the Jet Probe. Most of the good stuff I liked has been retained, and a few more goodies have been added to make it even better.

KIT FEATURES

The gearboxes, drive system and arms are almost exactly the same as those on the Super Probe, and they need



To improve the rear ground clearance, the lower arms are "arched." On the Jet Probe, the wing is not actively connected to the suspension.

no improvement. On the Jet Probe, however, the entire layout of the chassis is different. The engine and tank are mounted on the left side of the chassis, and the servos, receiver and receiver pack are on the right.

The biggest problem with the Super Probe was that there wasn't a good place to mount the receiver. It was supposed to fit behind the throttle servo, but the location left it exposed. The Jet Probe solved this problem in a big way; the entire radio system is mounted on one tray that can be removed from the chassis for maintenance. The receiver and the battery pack are now mounted in an enclosed case behind the throttle servo. This case also includes the switch mount so you can seal all the important stuff out of harm's way. The case will easily fit a 5-cell AE pack and most receivers. The switch is underneath the case, so it can't be shut off by mistake.

Shims have been added to the front arms so that the amount of caster can be adjusted. The shims snap onto the upper arm pin so you can space the arms forward or backward. Like the original Probe, the rear arms are arched to provide better ground clearance. The front upper arms have an extra bolt with which you can lock the length once you've set it properly.

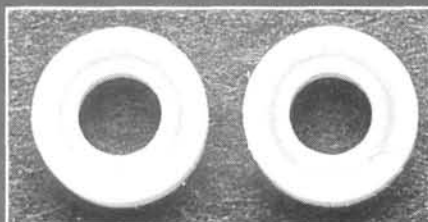


Likes

■ **The clutch setup.** The car comes with a lightweight flywheel and a ball-bearing clutch bell! You definitely don't have to worry about replacing this setup with a better unit.

■ **I never liked the shocks on the Super Probe; they worked well on the track, but without any type of anodizing, they wore out quickly.** Well, the Jet Probe's purple-anodized shocks are probably the best I've ever seen. What really impressed me was the true oil seals. Just about every shock on the market uses O-rings to seal the oil in the body. The Jet Probe's shock-seal configuration is more

effective than that of an O-ring (see photo).



■ **In the Super Probe, fiberglass disks were included instead of high-performance disks.** In the JP, the high-performance disks are included. Instead of mounting the brake disks on the center differential, they're mounted on the front and rear gearboxes. This makes adjusting the bias easier. Front and rear brake tension can be adjusted independently.

Dislikes

■ **I was a little disappointed with the fit of some of the hinge pins.** Most of them fit the way they should, but the upper front hinge pins were a bit sloppy. I ran some thin CA into the hole for the hinge pins, and I made sure that the arms could still move freely.

■ **The differentials that come with the Jet Probe are like the ones**

that were in the Super Probe, i.e., plastic diff cases with hardened-steel gears inside. While they work well, they aren't sealed well enough to keep silicone diff grease inside. A little silicone sealant around the case seam stopped this pretty well, but it would be better if they had O-ring seals.

TEST GEAR

Not many people in the U.S. are familiar with Mondial engines. Maybe it's because they don't have cool anodized heads or some exotic name, but in Europe, they're very well known. They're manufactured in Italy and imported to the U.S. by Racer's Choice.

Mondial engines have several features

that set them apart from other engines. First, they have very large heat-sink heads and a separate head button—a nice feature, because if you strip out or cross-thread the glow-plug hole, you can replace the button without replacing the whole head. You can also switch to a turbo-plug setup by buying a new head button.

THE COMPETITION

	PIRATE RS	HODR	ATHLETE	JET PROBE	TURBO INFERNO
Wheelbase	12.75	12.80-13.0	12.70	12.75	12.90
Width	12.00	12.10	12.00	11.75	11.9
Weight	7lbs., 10.7 oz.	7lbs., 7 oz.	7lbs., 6 oz.	7lbs., 8.5 oz.	7lbs., 6.4 oz.
Diff type	Planetary	Planetary	Planetary	Planetary	Bevel
Brakes	Dual disk	Dual disk	Dual disk	Dual disk	Dual disk
Exhaust	Header	Header & pipe	Not included	Header & pipe	Not included
Price	\$679.95	\$475.00	\$649.99	\$595.00	\$679.95
Available at*	\$399.99	\$289.99	\$439.99	\$369.99	\$499.99
Issue reviewed	12/93	4/94	9/94	1/95	9/94

*Prices may vary depending on location.

The slide carb on this Mondial is one of the best I've ever seen. Believe it or not, it's a true ABC carb with its aluminum body and chrome-plated brass barrel. It's very smooth and made to last.

The engine I used in the Jet Probe is the Mondial Pro-Series. This top-of-the-line, off-road powerplant is very well-built. Unlike most of the hi-zoot race engines, it's a three-port engine, but don't let that fool you into thinking it isn't as powerful. Just because an engine has more ports doesn't mean it has more power.

Although the Probe comes with a pipe, I used a Mondial pipe that was designed to go with the engine I used. It's very slim and fits

Building and setup tips

Building the Jet Probe isn't very difficult:

- Read the instructions carefully.
- Be extra careful when you assemble the shock seals; use thick grease to lube the seals before you slide them into the shock bodies.
- To swap crystals easily, use Racer's Choice* remote crystal extension. Cut a hole in the case lid and run the extension's wire through to the receiver. Add silicone glue to seal the case lid. The only reason to open the case is to reach the charging jack.

well within the body. It doesn't have a mounting lug, so I used a piece of piano wire to secure it to the chassis.

The Mondial air filter is simply massive! If I attached it to the carb directly, it would block almost all of the cooling air and would require a huge opening in the body. I mounted it to the carb with a silicone elbow coupler so that it was out of the way. On the top of the filter is a bolt that lets you open it up and remove the foam filter. It also allowed me to add a support wire to hold it to the chassis. The filter is secured to the car so well that I can pick up the entire chassis with it.

Once again, my radio system is a conglomeration of several different components. I used a Futaba* PCM radio and receiver, a KO* 1001 servo for the steering and an Airtronics* 94151 for the throttle. I was a little worried about using the 1001 for steering in a gas car, but it performed flawlessly. The 94151 was also a great choice and gave instantaneous throttle as well as brakes. I recommend the BEC guardian for any gas car. It provides a good visual indication that tells you

FLYING POINT JET PROBE

SPECIFICATIONS

Scale 1/8
List price \$595

DIMENSIONS

Overall length 17.5 in.
Wheelbase 12.75 in.
Front width 11.75 in.
Rear width 11.75 in.

WEIGHT

Gross (ready to run) 7lbs., 8.53oz.

CHASSIS

Type Double-deck
Material Aluminum,
upper and lower

DRIVE TRAIN

Type Gear

Primary Spur/pinion/clutch
Transmission Gear
Differential(s) Planetary gear
Bearings/bushings Ball bearings

SUSPENSION

Type (f/r) Upper/lower A-arm
Damping Oil-filled coil-overs

WHEELS

Type (f/r) One-piece plastic
Dimensions (DxW) 3x1.75

TIRES

Front/Rear Block pattern

POWERPLANT

Engine, pipe Mondial Pro, Mondial
EFRA 001

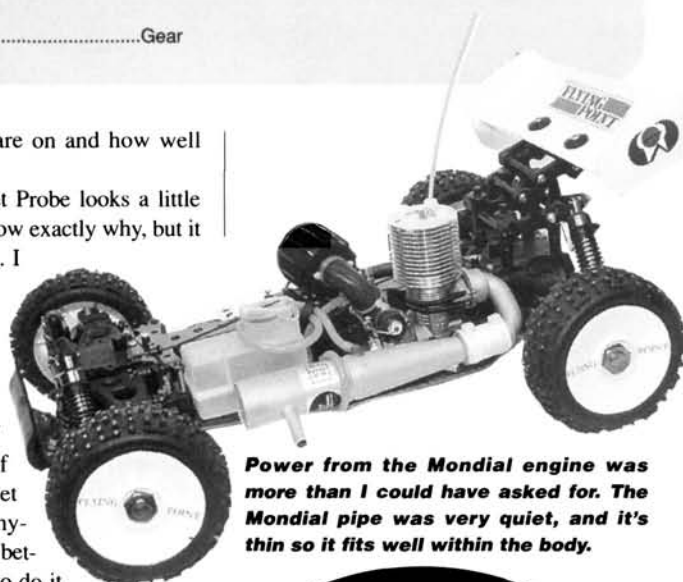
when the electronics are on and how well charged the system is.

The body for the Jet Probe looks a little funny to me. I don't know exactly why, but it just looks a little weird. I was trying to come up with a paint scheme that would make it look better, but I was having no luck, so I sent it off to Richard Muise of Motion Graphics* to let him do his thing. If anyone could make it look better, Rich was the man to do it.

He whipped together a design that not only looks good, but also complements the purple chassis parts. If you want a seriously cool-looking body, call Motion Graphics!

PERFORMANCE

Doogie and I took the Jet Probe to a local ball field to break in the engine and take some photographs. The engine was very difficult to start because of the extremely tight fit between the piston and the sleeve. This made for great compression, but it was difficult to turn the engine over. I eventually loosened the glow plug and started it like that. Once I got the engine fired up, I let it run for a minute or two to start the break-in process; then, I tightened the plug. The engine was set very rich, so there was plenty of smoke and oil exiting the pipe. After five tanks of fuel, we headed out to the dirt. By this time, the engine had been broken in well, and it was reaching higher speeds. A



Power from the Mondial engine was more than I could have asked for. The Mondial pipe was very quiet, and it's thin so it fits well within the body.

Things you'll need

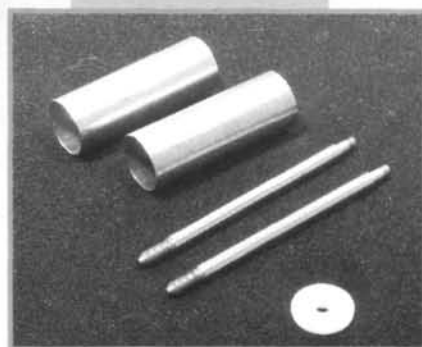
Most 1/8-scale gas cars don't come with all the things you need to get them running. The Jet Probe comes with a nice header, a pipe, a flywheel and a clutch setup, but here are a few other things you'll need to complete the kit:

- .21 engine with air filter
- Fuel
- Glow-plug igniter
- Hand starter or starter box
- A good 2-channel radio system with a Ni-Cd receiver pack

quick shot with the temp gun read 149 degrees; yeah, it's rich! I leaned it in a bit, and we were off.

The tires that come in the kit proved to be great for the dirt we were on. Their aggres-

Factory Options



• A full set of Thorsen differentials is available separately for the front, middle and rear gearboxes and will increase performance dramatically. They're designed to eliminate the "unloading" that's common on bevel and planetary diffs so power isn't wasted through the wheel that has the least traction. While they improve performance dramatically, they're expensive—about \$135 each—but they cost less than similar Thorsen diffs for cars like the Inferno and the Pirate.

• To increase durability, add a set of titanium nitride shock shafts. For the rear shocks, there's also an optional Teflon piston set that comes with a brass sleeve. The sleeve fits inside the shock body and, with the new pistons, it makes the action much smoother.



sive pattern dug right into the dirt and spun rooster tails into the air. The front shocks seemed to need a little heavier oil. The nose of the car rose and fell as the throttle was applied and released. Jumping was easy and very controlled. The brakes worked almost too well and had to be adjusted so they wouldn't lock 'em up too quickly.

As with the Super Probe, the body lets the engine get plenty of air to keep cool. The Mondial I tried had such a massive heat-sink head that I put a couple of tie-wraps on the top to protect it in case of a rollover. The only thing I didn't like about the engine in this car was the location of the low-end screw. It's nearly impossible to adjust unless you have a long, thin screwdriver.

I liked the Jet Probe very much. It has lots of great features, and it's very heavy duty. And, oh yeah, it costs about \$100 less than similar buggies, yet it comes with a header and pipe!

*Addresses are listed alphabetically in the Index of Manufacturers on page 232.

PROJECT

INFERNO 10

LET'S GET TRUCKIN'

by
A.R. FLATBUSH



buy it. This engine comes with a heat-sink head and puts out about 40 percent more power than the standard CZ-R. It replaced the stock engine, which I ported and set aside as a spare.

The added boost would be wasted with Oilite bushings, so I replaced them with a Trinity* bearing set (no. 7866)—5x10mm wheel bearings and 8x14mm diff bearings. (The Inferno 10 comes with diff bearings, but the Trinity set was on sale for less than eight separate 5x10s.) I also replaced the front

EVER SINCE Kyosho's $\frac{1}{8}$ -scale Inferno Stadium Truck came into my life, I've been hooked on 4WD! So when Kyosho introduced the 4WD Inferno 10, I made a beeline to the nearest hobby shop and snagged one.

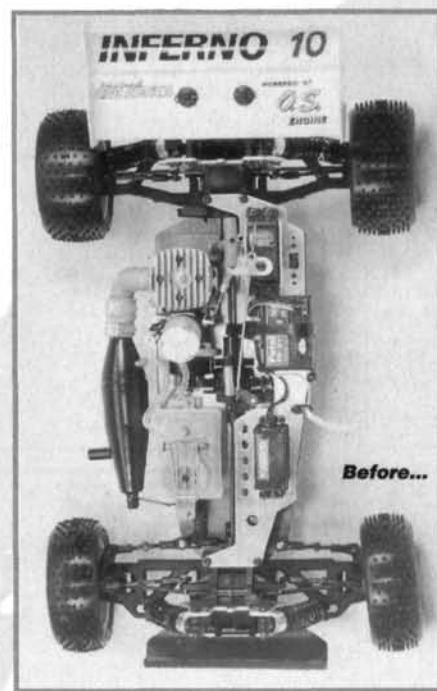
The kit includes an O.S. CZ-R .12 engine with a new Kyosho pull-starter, a header and a compact performance pipe. Based on the electric 4WD Lazer, the Inferno 10 came with Kelron plastic shocks and Oilite bushings, but I knew plenty of hop-up parts were available to make it a real race weapon. I put the basic kit together at a feverish pace, broke in the motor, then started the long process of hopping it up and dialing it in.

Between the mongo jumps (Earth to Inferno: you're breaking up!) and the rocky soil, the low-riding Inferno 10 buggy had a clearance problem. Rocks kept lodging in the flywheel and stalling the engine, so I decided to turn the 10 into a $\frac{1}{10}$ -scale version of the Inferno ST. The body mounts

were easy: I had a Team Losi* LX-T front body mount, which I bolted right up to the front shock tower (replacing the upper shock spacers). I also had a pair of HODR* body mounts (it, too, had become a truck), and I screwed them on to the Inferno 10's rear shock tower. HPI's* Super Star wheels with Pro-Line's* Pro-94 "Y Design" can be bolted right on to the Inferno 10, so the conversion to trucking was painless. The added ground clearance solved the problems with rocks and also increased tire contact. Hmmm...More tire means I can run a hotter engine!

HELLO CZ-Z!

Although the CZ-R was fast, I had trouble with the starter cord not recoiling. I was all set to eliminate the starter and buy the DuraTrax* Stage Two head and backplate heat sink (part no. 1521), but then the new, mega-powerful, O.S.* CZ-Z hit America, and I decided to spend a few dollars more to



Before...

PHOTOS BY A.R. FLATBUSH



...and after. As you can see, quite a few things have been changed. A CZ-Z replaces the stock CZ-R, and the most notable change is the Pro-Line tire and HPI wheel combo.

and rear dogbones with more efficient universal swingshafts (Kyosho part no. W-5061). With high-quality bearings and swingshafts, the Inferno 10 rips!

PUTTING IT TO THE GROUND

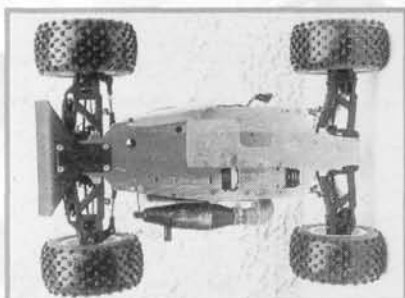
When power had been boosted from "Wow" to "Insane," tire growth became a problem. If the tires grow equally, you know your diffs are working well. In corners, the inside front tire on the pumped Inferno 10 would grow much more than the rest, so power was definitely being lost to wheelspin. My solution bordered on overkill, because it involved shocks, torsion bars and Thorp* ball diffs. The Rampage series diffs (no. 6050) come with hex-head bolts that attach the stock bevel gear to one side of the ball diff. DuraTrax also offers a Rampage ball-diff kit—one that replaces the beveled gear with a plastic center gear. Anyway, two Thorp gears went into Project Inferno 10—one in the front and one in the rear.

Next, after drilling the rear diff housing to accept the rear bar, I bolted on an Outlaw Rampage torsion-bar set (Kyosho no. LAW-02); then I bolted an old pair of Associated* Gold rear shocks (with gold springs and

25WT oil) onto the Inferno 10's rear. I bought a pair of DuraTrax Competition 3-inch shocks, installed the Inferno 10's shafts and pistons in them, and bolted them onto the front with the stock Inferno 10 springs. With aluminum shocks, sway bars, Thorp ball diffs and Lunsford* titanium turnbuckles (for the Lazer), the Inferno 10 ST was almost too ready to see the track.

BULLETPROOFING

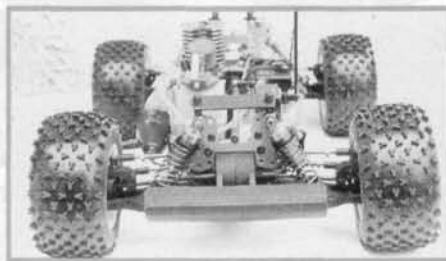
With the motor and suspension pumped and the sway bars increasing side loads on the chassis, flexing became a problem (so did chassis drag when the car bottomed out). To solve this problem, I bolted a section of graphite L-bracket along the right side of the chassis, from just in front of the fuel tank to the right motor mount. Then I ran a threaded rod from the L-bracket to the right front radio-



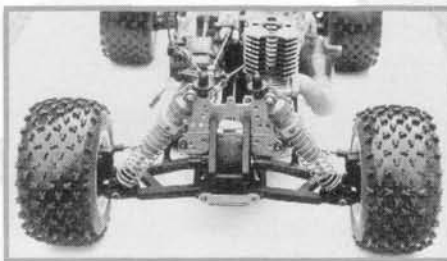
See the chassis scratches that were made when the Inferno was still in buggy form? After being converted into a truck, scratches became a thing of the past.

plate screw and made a front shock-tower-to-center-diff stiffener. While I was bulletproofing the 10 ST, I decided to countersink the anodized-aluminum chassis and install flat-head screws (Kyosho part nos. 1119 and 1148). Associated chassis film made the pan slicker still.

The increased load placed on the front hubs by the wide front wheels stripped an upper kingpin screw, so I replaced the stock flat-heads with 3x21mm ones. I also installed Lexan roost shields (see photo). During a long test session, one final problem



Up front, the stock bumper remains, but that's about it. I used a set of DuraTrax 3-inch Competition shocks to handle damping, and I also replaced the dogbones with more efficient Kyosho universals.



Out back, Team Associated Gold shocks take care of the suspension chores. Check out the nasty tread pattern on these Pro-Line Pro-94 "Y Design" tires. They sure do roost!

HOP-UP PARTS LIST

KYOSHO

- Special disk-brake rotor (no. 39306)
- 2 universal drive-shaft sets (no. W-5061)
- Sway-bar set (part no. LAW-02)
- 2 Outlaw Rampage wheel sets (no. UM-70)
- 3mm flat-head, self-tapping screw set (no. 1148)
- 3mm flat-head screw set (no. 1119)

DURATRAX

- Bolt-on rear heat sink (no. 1520)
- 3-in. competition shock set (no. 2129)

HPI

- Set of Super Star deep offset rear rims (no. 2180)
- Set of Super Star rear rims (no. 2135)

LUNSFORD RACING

- Set of Lazer ZXR titanium turnbuckles (no. A-609)

TRINITY

- Lazer ZXR bearing set (no. 7866)

ASSOCIATED

- Team 1.32-in. shock set (no. 6420)
- Clear chassis protective film (no. 6312)

THORP MFG.

- Rampage-series ball diffs (no. 6050)

showed itself: the brake caliper melted, so I replaced it with a special disk-brake rotor (Kyosho part no. 39306). Since then, I've enjoyed awesome braking and zero breakage.

WILL KYOSHO MAKE ONE?

Is 1/10-scale 4WD gas truck racing in our future? I sure hope so! Kyosho and Pirate make buggies that could easily become trucks. Following the progression of the 1/8-scale Inferno series, it's possible that a 4WD 1/10-scale ST may someday be available. Until then, the conversion is so easy that we can always do it ourselves.

*Addresses are listed alphabetically in the Index of Manufacturers on page 232.

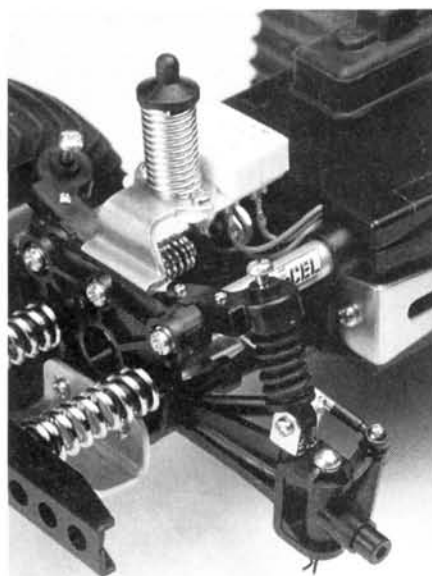
TAMIYA

wild Willy

by STAN VANDRUFF

I REMEMBER I took a Jeep ride once with an 18-year-old Marine through the California high desert. That Jeep's 4-cylinder engine was working overtime to maintain 70mph, especially considering that the tires rarely touched the ground! Well, that was the first memory to pop into my head when I recently got my hands on the Wild Willy Jeep kit—one of Tamiya's* early kits.

Wild, Wild Ride!



The front suspension is low-tech, but very rugged. Speed-control resistors are mounted up front where they get the most air.

THIS AIN'T NO JALOPY JEEP!

The chassis and suspension are made of tough ABS plastic and aluminum that will withstand some pretty brutal R/C abuse. The front bumper and body are supported by

heavy steel springs that will bounce back after colliding with boulders and rolling over cliffs (the plastic-covered, steel roll cage is also important here). Piano-wire wheelie bars protect the rear from bumps and prevent the Jeep from flipping over during wheelies.

Accessories include fog lights, a heavy-duty winch, a fire extinguisher, a spare tire and a 5-gallon gas can. For extreme performance, there's an onboard nitrous oxide tank!

For safety's sake, Willy always wears a full face helmet, a Nomex race suit and leather gloves and boots, and he is strapped in with a four-point safety harness.

Willy's paddle-tread tires are perfect for the beaches where he spends his summers. The tires are made of thin soft rubber and would collapse during Willy's stunts were it not for the foam donuts inside. The wheels are durable, two-piece nylon units. Ball bearings are standard on all four corners, and Oilite bushings are used everywhere else.

IN THE BOX

Racers and wall-bangers need the lightness and durability of Lexan bodies, but for me, there's no substitute for the beautiful detail of Tamiya's polystyrene bodies. Of course, Tamiya is well-known for its plastic display models, and the designers did a wonderful job on Wild Willy. All parts were molded in crisp detail and dyed green, black and white, in case you didn't have time to paint.

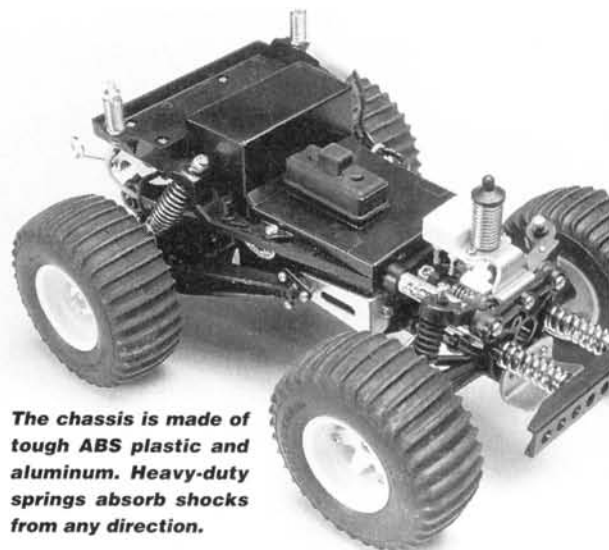
The parts were extra-strong and well-made, but this was an early R/C model for Tamiya. Though the kit was excellent, it wasn't quite up to Tamiya's

near-perfect standards of today. The parts bags were poorly arranged, and I had to remove one of the motor's pre-soldered capacitors to prevent the wheelie bars from shorting it out. I even found a mistake in the manual!

GET IT TOGETHER

Willy ranks near the top of my list of difficult-to-build kits. Since it was designed to be a stunt vehicle, its chassis bears little resemblance to a real Jeep, or any other vehicle, for that matter. Instructions were thorough, but Willy's unconventional design (by today's standards) kept me from recognizing parts in the way I can with a modern car. I was forced to follow the directions step by step.

Fitting the electronics into the radio box was a challenge. Everything got stuck in with servo tape, and there was barely room to cram it all in. I usually replace a mechani-



The chassis is made of tough ABS plastic and aluminum. Heavy-duty springs absorb shocks from any direction.



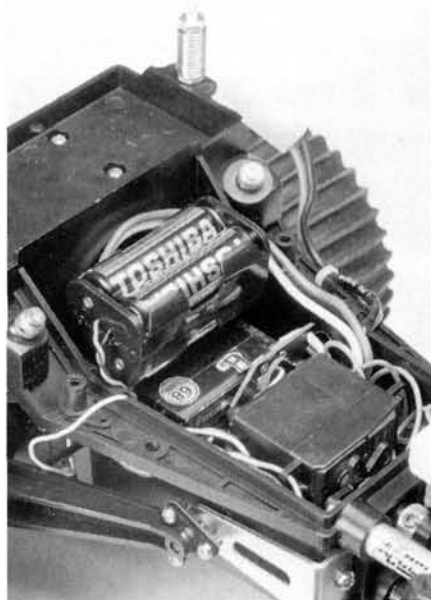
Though the transmission is small, the positively huge differential can withstand the pounding this heavy model gives it.

cal speed control with an ESC, but in the Wild Willy, the steering servo has to lie on top of the speed-control servo. If I had put in an ESC, I would have had to build a platform for the steering servo, and I don't think the ESC would have received enough air to stay cool. On the plus side, the radio box has a tightly fitting lid that's practically waterproof.

My only other gripe is that because parts are fastened to both ends of the motor, you can't substitute a more powerful motor for the one that comes with the kit.

You're stuck with the stock 540 motor or an identical replacement.

During construction, the windshield disappeared several times (why did I ever

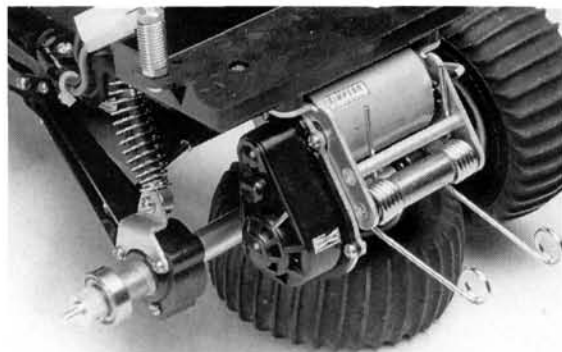


Tight! Normal-size electronics barely fit in the cramped radio box. An ESC would surely overheat in there, but once you get the lid on (don't pinch any wires), it's practically waterproof.

take it out of the decal bag?). By the time I had painted the body and was ready to install the windshield, I had permanently lost it. It was easy, however, to make a replacement with scrap Lexan.

WILD RIDE

Wild Willy has an especially short wheelbase combined with a high center of gravity. A quick pull on the throttle easily brings the front wheels up. With the front wheels in the air, Willy is stable and runs in a straight line. Though driving in a straight line is easy, the large undamped springs (no shocks; just springs!) on all four corners make it impossible to drive a predetermined course on a rough track. Rather than causing frustration, this uncertainty adds to the excitement of driving it.



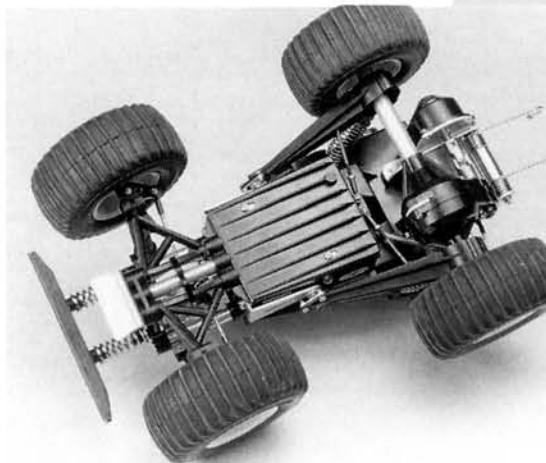
The small transmission includes a slipper clutch to protect the gears from rough landings. Power gets to the wheels through a massive hex drive that won't strip out.

Climbing hills is another matter. It's a perfect example of one step forward, two steps back. Attempts to climb a steep hill result in the Jeep rolling over backward until it gets to the bottom. Climbing in reverse cures this problem, but then there's not enough traction.

WILLY OR WON'T HE?

Now that I've finished the kit and have driven it around, I have to decide what to do with it. The kit is detailed enough to be a showcase model, but it could also turn out to be the most enjoyable R/C model I have. On one hand, it's out of production, and replacement parts aren't available; on the other hand, what other kit can do better wheelies?

Even if this weren't a rare kit, I would hesitate to drive the way I want to for fear of damaging the plastic body. I think Tamiya should have offered a Lexan "stunt" body to replace the "show" body when you really want to have some fun.



Massive ABS trailing arms hold the aluminum axle tube. Three more aluminum tubes keep the front end rigid.

GET WILD

Now put down this magazine and run, don't walk, to your local hobby shop. Look under all the counters, up in the attic, and behind every kit on the shelf to see if there is a forgotten Wild Willy hiding somewhere! If you don't find one, write to Tamiya and beg them to bring it back. (They brought back the Bruiser, didn't they?) Happy hunting!

*Addresses are listed alphabetically in the Index of Manufacturers on page 232.



TAMIYA WILD WILLY

TypeOff-road stunt Jeep
Scale1/40

DIMENSIONS

Overall length13.5 in.
Width9.5 in.
Height10.5 in.
Wheelbase6.9 in.
Front track6.5 in.
Rear track7.7 in.

WEIGHT

Gross (with battery)5 lb., 12 oz.

BODY

TypeWillys M38 Jeep (circa WW II)
MaterialPolystyrene

CHASSIS

TypeTub
MaterialABS

DRIVE TRAIN

PrimaryPinion/spur
DifferentialBevel gear
Bearings/bushingsBall bearings in all four wheels; Oilite bushings elsewhere

SUSPENSION

Front: typeSwing arm
DampingCoil springs—no damping
Rear: typeTrailing arm
DampingCoil springs—no damping

WHEELS

Type (f/r)Two-piece nylon
Dimensions (DxW; f/r)1.9x1.5 in.

TIRES

(F/r)Short paddle with foam liners

ELECTRICS

MotorRS540S
Battery6-cell hump pack
Speed control ...3-step forward/reverse

OPTIONS TESTED: nitrous-oxide injection, Hella 192 driving lights, Yankum-Hard model 24 winch, Futaba* Magnum AM radio with S148 servos.

HITS

- Radical scale body and driver
- Great wheelies

MISSES

- Uses oddball hump-pack batteries
- Cramped radio box
- You can't get one!

How to drive

by John Howell



OK, ALL YOU monster truckers, here's a little crash course on what you should and shouldn't do when driving your truck. Unfortunately, in some cases, we had more fun trying a lot of the "don't do's," so they outnumber the do's.

Now it's time for our mandatory warnings: this article is a goof, so

crush course

don't try to run over your friend's head; don't climb cliffs (you could get hurt); try not to

fall in the mud (you might get hurt); don't drive your truck under water (it might damage your electronics, and you might get hurt fishing it out); don't have too much fun (your brain might hurt)...and don't forget what your mother always says: "You're gonna put your eye out with that monster truck!"



Monster Trucks

CAR CRUSHER



Now, don't try to drive your truck over your parents' new full-size car; they might go aggro on you. Try to round up a few old R/C car bodies to thrash on. Line them up, and get ready to destroy. Just make sure that you don't flatten your friend's newly painted concours body without knowing it!



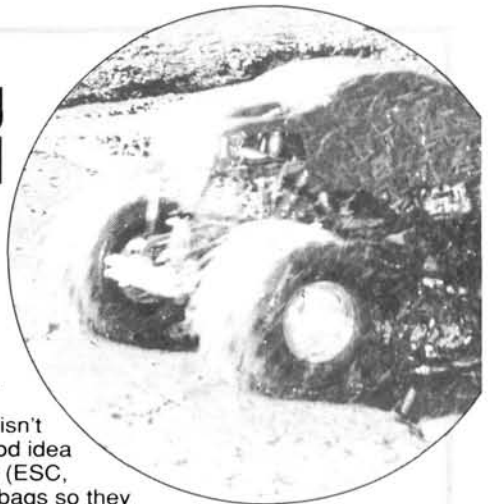
Impossible Obstacles

Come on now, some obstacles aren't meant to be climbed. Yeah, it's a good thing to strive to overcome the toughest obstacle, and we all know that monster trucks can get over just about anything, but be realistic in your goals. Attempting to climb cliffs or other impossible obstacles will only leave you with fried diffs and, possibly, a bunch of broken parts. Try to stick to 1/10-scale obstacles.



Taking a Mud Bath

One of the coolest and craziest things to do with your monster truck is to find a little bit of mud and go hog-wild. The thicker the better, right? Just make sure it isn't too deep! Also, it's a good idea to wrap your electronics (ESC, receiver, etc.) in plastic bags so they don't get wet. If you do run your truck in the mud, clean it as soon as you've finished; don't wait three months, or the mud might become a permanent feature on your vehicle. Before you go mud whomping, take a cue from gas racers, and spray your entire truck with a coat of WD-40. This helps repel mud and water, and afterward, it will make your cleanup a whole lot easier.



DON'T DRAG RACE

Running your monster truck on a busy road isn't such a great idea. First, it's a danger to automobile drivers; to miss your truck, they might swerve and hit someone. Second, what if they don't swerve? 'Nuff said.

TRAIN TRACKS...



Do we even have to tell you why this isn't such a great idea? But if you feel compelled, *definitely* unplug the Walkman.

BAD IDEA!

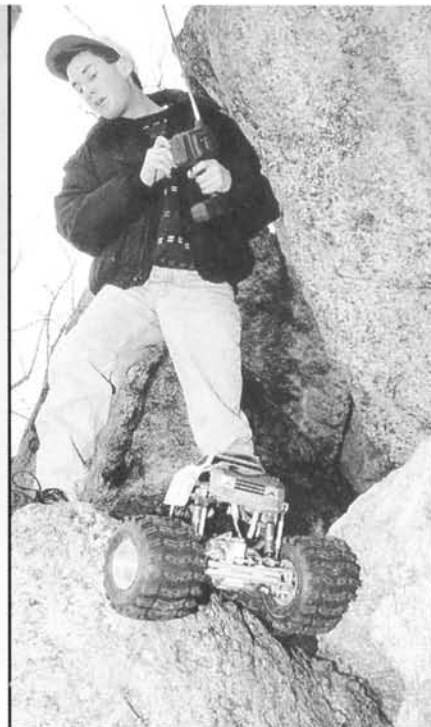
WHAT DO YOU MEAN, IT DOESN'T FLOAT?

Unless you've designed it to do so (or you have an old MRP High Roller), your monster truck won't float! If your truck goes swimming, you can kiss your expensive electronics goodbye. On the other hand, if the pond or lake is frozen, be prepared to have a total blast. Monster trucks love romping on the ice and snow—as long as the snow isn't too deep. Just don't forget to protect your electronics!



DON'T CRUSH YOUR FRIENDS!

Yeah, it's cool to run over your buddy's noggin, but there's a small chance it might hurt him. Start on his legs, and see if that bothers him. If it does, he's a sissy; if he's a real man, lay tread on his head.



RAPID DESCENT

Climbing a hill is really fun, but going down huge drop-offs isn't so great for your truck! Here's a good rule of thumb: if your truck can make it up a hill, it will probably be able to get back down without wadding itself into a ball of shrapnel. If you have to climb the hill like a billy goat to get to the top just to drive your truck down...you might want to reconsider. If your truck is equipped with a parachute, ignore the above.

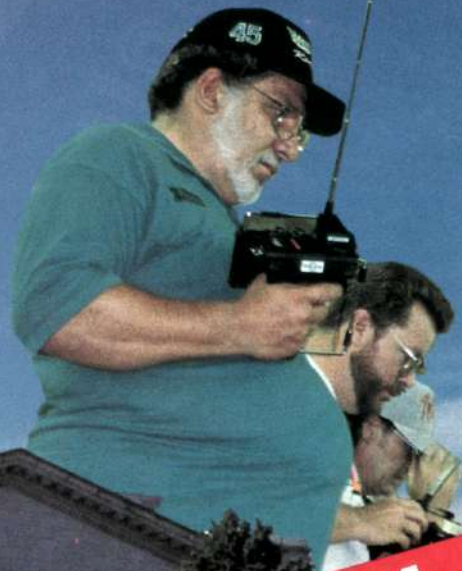
Conquering hills with your monster truck is a blast—that is, if there are any hills in your area. If there are, make sure it's legal to be in the area, or on the hill, for that matter! Dirt flyin' everywhere...man, it's a wild sight. They're also good places to put new modifications to the test. Be careful when you turn your truck around at the top of the hill so that it doesn't come tumbling down end over end. ■



GO CLIMB A HILL

TEAM LOSI

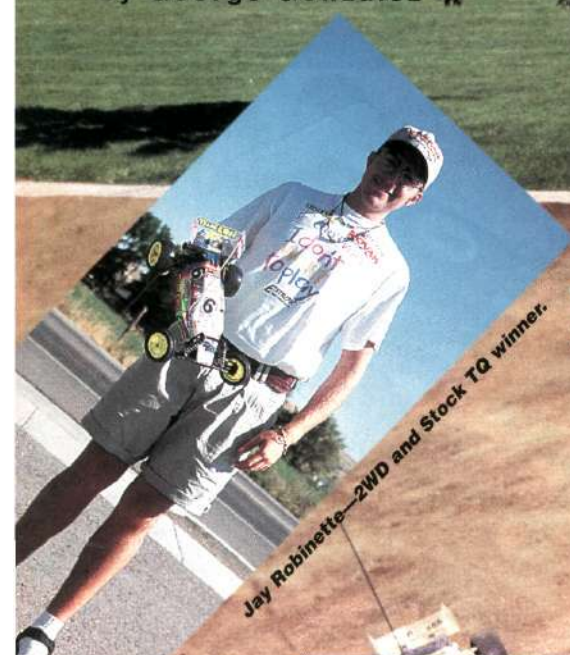
NOVAH
ELECTRONICS, INC.



Roar Off-Road Stock Nationals

Pros
go home!

by George Gonzalez



Jay Robinette—2WD and Stock TQ winner.



AFTER A TWO-HOUR flight on the R/C Car Action company jet, I found myself in Salt Lake City, UT, still shaking from the flight. I have to admit, Chris Chianelli isn't a bad pilot, but I could have done without the aerobatics. I had to rent a car, find my hotel and get to the track to cover the '94 ROAR Off-Road Stock Nationals.

On my arrival at Hansen's Intermountain R/C Raceway in Magna, track owner and host Kevin Hansen filled me in on the details. This year, ROAR divided its Off-Road Nationals into three divisions:

- stock—2WD and 4WD.
- modified—2WD and 4WD.
- truck—stock and modified.

This change in format was made to give more racers a chance to compete in the more popular classes and to provide a little more elbow room at each of the events.

Held from July 29 to 31, the '94 Stock Nationals, which was sponsored by Team Losi and Novak, had a few new tricks in store for us. A couple of new racing classes were added this year—15-year-old and under and 40-year-old and over. These allowed racers to compete with others of their age and skill level, and will help to promote the hobby, I hope. Racers' ages ranged from 8 to over 65. Many notable R/C celebrities—including Gil Losi Jr., "Pops" Losi, Gary Kyes, Bob Novak, Tyree Phillips and Rick Hohwart—were there to help the racers. Also present were Chuck Stary and Charlie Perez from World Class Competition Batteries to take care of all the racers' battery needs. Of course, some of these R/C celebrities had time to compete as well; "Pops" Losi and Bob Novak battled it out in the 40-and-over class (Was Pops right when he said, "Even I could win with the Double-X car"?).

LET THE GAMES BEGIN

- **Concours** started things off: Charlie Perez took the first-prize trophy for his totally radical RC10 Team Car.



Buddy Rich came in second with his tricked-out RC10 Team car, and third was Mike Judd with his awesome-looking Yokomo YZ-10.

• **Qualifying.** After six gruelling rounds, it was all Jay Robinette in 2WD Stock; Jay was nearly 5 seconds faster than his closest adversary! In 4WD Stock, it was Rob Gillispie who ended up as the TQ after battling it out with Alex Mazuikewycz, Rhett McNair and Craig Lair for six rounds. Gary Kyes made an impressive R/C comeback by totally dominating the 40-and-over class. Phillip Harmon Jr. swept the 15-and-under class and took the TQ honors with an impressive 15/4:16.88 best time.



Charlie Perez—Concours winner.

?? Quizzin' the Champ— Jay Robinette:

After picking up his first-place 2WD Stock trophy at the Florida Winter Champs, Jay Robinette hopped onto his horse, Huckleberry, and blazed his way to Salt Lake City, UT, just in time for the ROAR Stock Nationals. Jay mentioned that the ride was quite an adventure, and his rear end was kind of sore. Nevertheless, Jay's sore hind quarters didn't stop him from winning the championship, and here's what he had to say:

GG: How hard did you find the racing this weekend?

Jay: The competition was very fierce, which is typical for stock racing, but everybody said I had a shot coming into it. That's not the attitude I adopted, however; but after I got the TQ by around 5 or 6 seconds, I became more confident, and each run just got faster and faster.

GG: Did you use a particular strategy to win this national championship?

Jay: Yes; I stayed up late working on my car and only got around three hours of sleep. The next day, I was too tired from the lack of sleep to be nervous.

GG: How did you like the track and the facility?

Jay: I loved the track—just tons of traction, and tire wear was minimal. The race ran great; perfect; very smooth!





**Phillip Harmon Jr.—
15-and-under TQ and winner.**

A-MAIN ACTION

• **15 and under.** Clearly the kid to beat, Phillip Harmon Jr. was the only contestant in his class to break the 15-lap barrier (no doubt, he had his Team Associated Worlds car tuned to perfection). In all three A-Mains, Phillip got an early lead, never looked back and ran away with the 15-and-under 2WD Stock National Championship. Flash Nolen and Eric Willardson battled for three rounds and tied for second. The racers' tie-breaking scores had to be called up, and it was Flash Nolen who ended up with second-place honors while Eric Willardson settled for third.

• **40 and over.** Team Losi's own Gary Kyes tore up his competition and was one lap faster than the rest of the racers in the first two A-Mains. With a perfect 200 points, Gary had already secured the ROAR 40-and-over Stock National Championship and had no need to race in the A-3 Main, so he stepped aside to let "Pops" Losi and Bob Novak duke it out. I couldn't believe how competitive these two R/C legends were; Pops ended up with the win in the A-3 Main, while Bob Novak finished in fourth. Brent Stevenson ended up taking the second-place trophy, while "Pops" Losi picked up a trophy for his third-place overall finish.



Gary Kyes—40-and-over Stock TQ and winner.



Fifteen-and-under A-Main winners.

• **4WD Stock.** From what I've seen at the many local and national events I've covered, the 4WD class has always been the fastest off-road racing class, but for some reason, it draws the fewest contestants. At this event, however, 4WD Stock drew nearly as many contestants as the ever popular 2WD Stock!

Gillispie's scratch-built Yokomo was totally hooked up; in fact, Gillispie averaged an 8-second overall lead in both the A-1 and the A-2 Mains. Gillispie secured the ROAR 4WD Stock National Championship with the ease of a true champion, and he took a DNS in the A-3 Main to let Craig Lair and Rhett McNair battle it out for second.

In the A-3 Main, it was a real scramble, as the cars were bunched throughout the race. Craig Lair set the pace with Rhett McNair and the rest of the pack following less than 1/2 second behind. With less than 20 seconds left, a major pile-up in the doubles section put McNair in the lead and helped him secure second place overall. Lair, who really tore it up through the entire event, ended up with third overall.

• **2WD Stock.** The ROAR 2WD Stock National Championship is one of the most coveted titles in R/C racing, so it

Personalize Your Toys à la TK Customs

As I walked around the pits, I couldn't help but notice that most of the racers had some pretty cool-looking rides. Although all the custom paint jobs were unique in their own ways, they all seemed to share a familiar style. Later, I met up with Todd Kerby of TK Customs, and it all started to make sense; Todd lives in Salt Lake City, UT; he's the local airbrush wizard and pretty much a legend around town.



Todd custom-painted many of the bodies you've seen in *R/C Car Action*. He doesn't just customize R/C bodies; he's even better known for his custom-painted helmets, bikes and personal water craft. I have a couple of his masterpieces at home, and let me tell you, they're real showstoppers. Both the second- and third-place concours winners were decked out with TK Customs bodies!

If you have a special toy that you'd like to have personalized, give TK Customs a call at (801) 350-3609.



Rob Gillispie—4WD Stock TQ and winner.



Forty-and-over A-Main winners.



Four-wheel-drive Stock A-Main winners.

isn't any wonder that many of the drivers traveled thousands of miles for a shot at it. The cars were so evenly matched that it took a combination of perfect tuning and precise driving to win the event.

Jay Robinette was challenged by Chad Phillips for the championship. In the A-1 and A-2 Mains, the first-place trophy was well within Phillips' reach, but Robinette, who took the lead early in both Mains, never gave him a chance to see the track in front of him. With his two first-place finishes totaling 200 points, Robinette took home the first-place trophy; Phillips' first in the A-3 Main was good enough to take second overall; Rob Gillispie did some pretty radical driving in all three Mains, and this earned him the third-place trophy.

Nationals went well considering it was the first time ROAR had divided it into three divisions. The age-group classes were met with great enthusiasm; they allowed the racers to compete with racers of their own



Two-wheel-drive Stock A-Main winners.

age and skill level. The staff at Hansen's Intermountain R/C Raceway did a good job of hosting the event, and it was a nice change of pace to see some real grassroots stock racing.

Well, I just heard that the *Car Action* jet is fueled and ready to take me back to California to cover the '94 ROAR Truck Nationals, which you can read all about in an upcoming issue. For now: good luck and good racing!

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
2WD STOCK									
1	1	Jay Robinette	Losi XX	N/A	Rossis	Novak H. Pro	Airtronics	Jammin'	HT Ribs
2	2	Chad Phillips	Losi XX	Handout	World Cl.	Novak	Airtronics	Jammin'	Losi Ribs
3	3	Alex Mazvrkewy	Losi XX	N/A	Racers Edg	Novak	Airtronics	Steck	4 Rib Gold
4	6	Rob Gillispie	RC 10	N/A	Racer Edg	Novak	Airtronics	Race Edge	Proline 8015
5	4	Albert Guardado	Losi XX	Handout	Orion	Novak	Airtronics	Jammin'	Ribbed Losi
6	8	Mason Marks	Associated	Handout	World Cl.	Novak	CS2P	RCPS	Losi
7	10	Alex Guerrero	Associated	N/A	Orion	Novak	Airtronics	Mirage	Losi
8	9	Mike Gardiner	Losi XX	Handout	Race Tech	Novak	Airtronics	Jammin'	Losi Rib
9	5	Todd Lewis	Losi XX	Handout	Voo Doo	Novak	JR 756	Jammin'	Losi HT
10	7	David Bonfoey	Losi XX	Handout	Rossis	410 HPC	Caliber	Stock Losi	Losi HT
4WD STOCK									
1	1	Rob Gillispie	Yokomo	N/A	Racer Edg	Novak	Airtronics	Racer Edge	Proline 8135
2	6	Jeff Phelps	Yokomo	Handout	Trinity	Novak	Airtronics	Stock	Proline
3	2	Alex Mazvrkewy	YZ-10	N/A	Racer Edg	Novak	Airtronics	Stock	ProlineFuzzies XTR
4	5	Jason Ashton	Kyosho	Handout	Integy	Novak	Airtronics	Losi	Proline Lunsford
5	8	Jared Craner	Kyosho	Handout	Sanyo	Novak	JR-Pro Pro	HPI Lazer	Proline 8135 Flat Fuzzy
6	4	Rhett McNair	CAT 2000	N/A	Reedy	Novak	CS2P	Stock	Proline 8135
7	10	Kenny Johnson	Precision	Handout	Double Str.	Tekin	Airtronics	Yokomo	Proline
8	3	Craig Lair	Yokomo	Stock	Orion	Novak	Airtronics	Yokomo	Losi
9	7	Todd Powell	-	-	-	-	-	-	-
10	9	Andy Wells	Lazer	Handout	None match	Tekin	CS2P	N/A	Proline
40 AND UNDER									
1	1	Gary Kyes	Losi XX	Handout	Trinity	Novak	Airtronics	Jammin'	Losi Rib
2	3	Brent Stevenson	Associated	Handout	NBS	Novak	Caliber	Mirage	Losi 4 Row HT
3	5	Chuck Connolly	Losi	Handout	Racers Edg	Novak	Airtronics	Losi	Losi/Proline
4	2	Gil Losi, Sr.	Losi XX	Handout	Trinity	Novak	Airtronics	Jammin'	Losi HT Rib
5	8	Chuck Stary	Assoc RC10	Handout	World Cl.	Novak	Airtronics	RCPS	Losi
6	4	Rex Baldwin	Schumacher	RacePrep	Zig Batts	Novak	Airtronics	Schumacher	Trinity Gumball
7	10	Mike Ziegler	Schumacher	RacePrep	Zig Batts	Novak	KO	Schumacher	Trinity
8	9	Marcy Starnes	Losi XX	Handout	Ballistic	Novak	Futaba Junior	Losi	Kyosho W5632S
9	7	Gordon Willardson	Losi XX	Handout	Racers Edg	Novak	Airtronics	Losi	Losi 7201G
10	6	Bob Novak	Assoc RC 10	RacePrep	Sanyo	Novak	Novak	Associated	Losi HT Rib
15 AND UNDER									
1	1	Phillip Harmon	World RC10	Handout	World Cl	Novak	CS2P	RLPS	Prline 4 Rib/Flat Fuzzie
2	2	Eric Willardson	Losi XX	Handout	Racers Edg	Novak	Airtronics	Losi	Losi #7201
3	-	Cody Orn	-	-	-	-	-	-	-
4	4	Flash Nolen	World RC10	Handout	Race Paks	411 G2	Caliber	Viper	Losi/Proline
5	5	Alexei Guinitara	Assoc RC10	Handout	Stealth	Novak	Airtronics	Pro-Line	HT Losi
6	-	Brian Dent	-	-	-	-	-	-	-
7	7	Ashley Morris	Assoc RC10	Handout	Stealth	Novak	Airtronics	Pro-Line	Proline
8	3	Junior Poulson	Losi	Handout	World Cl	Novak	Airtronics	Losi	HT Losi
9	-	Brian Anson	-	-	-	-	-	-	-
10	-	Chris Griffin	-	-	-	-	-	-	-



Start The New Year RIGHT!

YES, BOYS AND GIRLS, it's time to kick off the New Year right! And, in this special section, we're going to help you. To help you make those new-year purchases, we show all the hottest goodies that will soon be hitting the hobby-shop shelves. Our ace reporter Rick Schwartz will also help you get your New Year's resolution completed; you *did* say it was about building your own off-road track, didn't you? His comprehensive story will tell you all you need to know. And last, but not least, our good buddy George Gonzalez previews some of the hottest races that have already been planned for this year, so get ready! We hope all this helps you to start 1995 on the right road—the one that leads to the winners' circle. And we also hope that one of your resolutions is to get a few friends into R/C so they can share the fun!

Start The New Year
RIGHT!

new for
'95

IT LOOKS AS IF this year will be an excellent one for R/C'ers. We'd like to give you a quick tour of the upcoming year's hot new items, so get ready, get set, start salivating!

The Dynamite Pro-Start starter box is one trick, very convenient pit accessory! The box is designed to start 1/10-scale on- and off-road cars and trucks as well as 1/8-scale on- and off-road cars, buggies and trucks. Simply align the three posts on the box with your car or truck, and then press down on the vehicle to activate the starter switch. The box is available with and without a 12V starter, so you can use your own

hand-held starter unit. The box costs \$109.95 with the starter and \$89.95 without it.

DYNAMITE • Pro-Start



Even though shocks are now very technically advanced, they still provide equal damping on compression and rebound. RPM now offers shock pistons for Losi and Associated shocks that allow you to adjust the damping rate on

RPM • Two-Stage Shock Pistons

both strokes. Several rates can be obtained by using color-coded floating pistons and by flipping the assembly over. Be the first to try the next wave in shock technology!



PRO-LINE Sedan Hawg

Made to fit on both Kyosho's wheels and Tamiya's Sedan wheels, this new tire from Pro-Line—the Sedan Hawg—is available in that popular sticky XTR compound. You'll get traction galore with these! Prices will be announced later.

SCI Plutonium Pill

No, it isn't radioactive, but it will give you a boost—in run times and motor power. Plutonium Pill is an add-on for every SCI microprocessor speed control, and it's specially recommended for use with SCI's Stealth



Viper ESC. Use it instead of a receiver pack; it's lighter, and it will keep the voltage above 5 volts and allow the radio to operate glitch-free, even after the batteries have dumped. For details, contact SCI.



KYOSHO • Pro-X and Pro-XRT

been developed, fine-tuned and perfected in Kyosho's new Pro-X buggies and Pro-XRT racing trucks. New ideas have replaced outdated technology, and these advanced racers are available at a price that fits the average racer's budget. Wait till you see what they do to the competition!

Finally, you don't have to own a million-dollar machine to be competitive in serious off-road electric races. Enhanced design capabilities have

OFNA has come out with a 1/8-scale gas car for pavement pounding. The new Colt is a 4WD on-road racer that comes 80 percent built with a two-speed transmission. Power is transferred to the one-way front drive system by means of tough Kevlar belts. As with all good 1/8-scale cars of today, everything from ride height to caster angle is adjustable. Best

OFNA • Colt



of all, the Colt costs much less than other cars in its class—\$639.95 (list price).

Are you yearning for that little extra boost of power? Why not bolt in a bigger block? HPI's new

Both units come equipped with a pull-starter. Contact HPI for more information.

HPI • Nitro Star .15 Gas Engines

.15 engines can be bolted right into anywhere you can fit a .12, but they put out more power. The standard engine is made of cast-aluminum parts, and the SS version is made using precision-machined aluminum parts for even more power.



MIP • Onboard Temperature Gauge

Knowing the temperature of your gas engine is of vital importance to keeping it running well for a long time.

Now, thanks to MIP's new Onboard Temperature Gauge, you'll be able to see what the temperature is at a glance. The battery-powered gauge



has an 8-inch-long wire attached to a thermistor probe lug that's bolted right onto the engine head. The compact, lightweight unit weighs just

0.5 ounce and measures 1 3/4 x 3/4 inches; and temperature readings range from 0 to 450 degrees Fahrenheit (for the foreign market, MIP plans to release a Centigrade unit). List prices: \$47.50 (Fahrenheit), \$49.50 (Centigrade).

New for this year from Novak are the Racer and Hammer Pro ESCs. Both of these high-



NOVAK • Racer and Hammer Pro ESCs

frequency, racing-style ESCs feature Novak's easy One-Touch Set-Up™ system and Radio Priority circuitry, which allows you to control the steer-

ing even after the battery has dumped. Both have purple-anodized heat sinks, capacitors, BEC, dual LEDs and Novak's 90-day warranty.

According to Traxxas, their new, full-blown, high-performance stadium truck, the Rustler, incorporates all the latest in design and plastics technology. Its performance is comparable to that of the most expensive competition trucks on the market, but its price can be compared favorably with the least expensive. The Rustler features a double-deck, reinforced, channeled-fiber composite chassis; extra-long, fiber-composite front and rear arms; a competition-proven, bellcrank steering system; telescopic, U-joint, sliding drive shafts; a three-gear, 48-pitch transmission with steel gears; and interchangeable spur gears and pinion gears. With a motor and speed control, the truck retails for \$150; and the ready-to-run version, which includes the radio system, costs \$260.



TRAXXAS • Rustler Stadium Truck



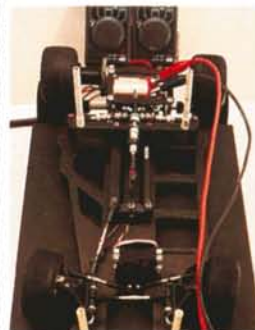
TRAXXAS Stampede Monster Truck

aggressive-tread monster tires; extra-long, large-bore, high-volume shocks; and telescopic U-joint drive shafts. The truck is available in two versions: with a motor and speed control for \$170; and ready to run (with radio) for \$280.

Traxxas designed the Stampede to be the first high-performance monster truck. It features long suspension travel, high ground clearance and an efficient, three-gear, variable-ratio transmission with a steel planetary-diff gear that can be adjusted for "...power to pull or speed to fly." The truck also has a fiber-composite channeled chassis;

PSE • Thor Dyno

PSE has introduced a new dyno. Unlike previous designs, the Thor dyno tests the motor while it's still in the car. Put the car on the dyno with the rear wheels resting on another set of wheels that are



connected to the dyno. As the motor spins the car's wheels, the other wheels rotate and display rpm and amp readings on inexpensive DVMs. The Thor Dyno retails for \$379.95.

ROBINSON RACING RC10GT Clutch Bells

Robinson's new clutch bells for the RC10GT are machined out of a single piece of hardened steel—a one-piece design that



makes them extremely durable and true. A special groove prevents dirt from packing in both the clutch bell and spur gears. Clutch bells are available in sizes with from 15 to 18 teeth.

PROTOFORM Rambunctious GT



The latest off-road truck body from Protoform is this distinctive new Rambunctious GT. Designed specifically to fit the Associated RC10GT, it offers bold styling as well as many functional features. Each wheel opening has molded-in dirt deflectors to keep the chassis and rear shocks clean, and an add-on rear spoiler helps to keep the rear tires planted. This 0.040-inch-thick Lexan body is ROAR-legal, and its retail price is \$19.95.



DAHM'S RACING BODIES M3 Extreme

The hot new body for 1/10-scale gas cars is Dahm's M3 Extreme. It was designed to fit cars like the Serpent Impact, the BMT 931, the Parsec Prisma and the Delta. The M3 Extreme is low, wide and sleek, and it's the most advanced body for Trans Am and Sedan racing. A version of the M3 will soon be available for Tamiya 1/10-scale 4WD sedans.



CALANDRA RACING CONCEPTS Cool It Heat Sink

Specially designed to fit into the tight confines of the new Losi Double-X series of off-road vehicles,



the Team CRC snap-on "Cool It!" heat sink keeps your racing motor running strong. Made of light aluminum and anodized in a variety of colors, with today's hot running laydown motors, this heat sink is a must for any off-road racer.



Bolink • 1/4-Scale BoKart

Bolink has turned their popular 1/10-scale sport chassis into a go-cart called the "BoKart." The chassis features a ball differential, aluminum motor mounts and a cool three-piece body. Get a bunch of these together in a parking lot and have a blast! The BoKart retails for \$99.95.

HOBBY WAREHOUSE Motor Man Big Bore Motors

These new motors are custom-wound for the ultimate in speed and efficiency. They use the laydown Yokomo can and hand-wound armatures, and they're available in all popular winds. The part no. is MM10XX, and the retail price is \$85.



PROTOFORM • 1995 Monte Carlo SS Body



Protoform's WCMC body is made to fit all superspeedway-width chassis, and it offers plenty of downforce to handle paved or carpet tracks of all sizes and with all types of banking. The molded-in detail is all there, right down to the add-on spoiler and simulated roof flaps. This new body is NORRCA-approved and is available in light or regular weights. The retail price is \$19.95.

ETA RACING Precision Diff Balls

ETA Racing's 1/8-inch precision diff balls are made of chromed steel and offer a 0.0000025-inch tolerance of roundness. Fifty come packed in a handy tube with special ends that prevent it from rolling off your workbench. Price—\$2.95.

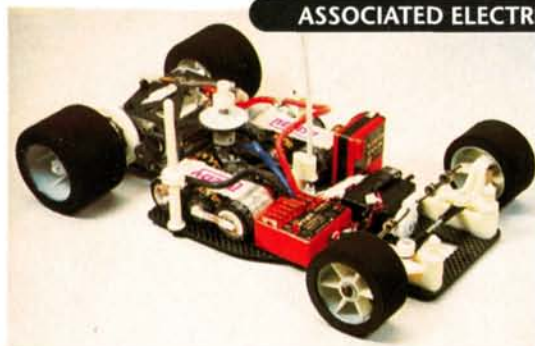


A-MAIN RACING LX-T Gas Conversion

If you have an LX-T and are thinking of converting it to gas, check out the new A-Main conversion. After years of testing and refinement, the kit is now available for your use (or abuse), and it's already winning at local races.

The Club Racer 12 from Team Associated is a high-quality racecar kit with a graphite chassis, ball bearings and mounted wheels and tires. It was designed for rac-

ASSOCIATED ELECTRICS • Club Racer 12



ers who are just starting out in 1/12-scale indoor racing or 1/12-scale outdoor parking lot racing. Even first-time builders will find the car easy to build and easy to set up. The car retails for \$120—without a radio, speed control, batteries, motor and body.



BENNETT EQUIPMENT Clod-A-Leaver II

Bennett Equipment's winning Clod-A-Leaver suspension kit is now combined with a lightweight chassis (8 1/4 ounces) to create the Clod-A-Leaver II. Features include a long-wheelbase aluminum chassis, stainless-steel ladder bars and tie-rods, 6-32 ball ends through-out, full cantilever suspension and a low ride height. A new steering kit is included as standard equipment; it has axle-mounted servos with brush guards, and the kit also includes front and rear sway bars. The Clod-A-Leaver two-wheel-steering kit sells for \$225, and the four-wheel-steering kit is listed at \$250.



TEAM LOSI Wide Body Rib Front Tire

Team Losi has just introduced what's sure to be a hot item for 2WD buggies. The Wide Body Rib is similar to the tire teams have been making by gluing an extra set of ribs



into a narrow front rib, yet it's far easier to mount. Like the standard, narrow version, the Wide Body Rib is ultra-stable, yet it has more steering and handles better in the rough sections of a track. The Wide Body is available in both the HT and Gold compound with foam inserts.

A&L MFG. • Flier

A&L's new Flier body for Team Losi's Double-X features a low-profile design, greater down-

force, molded side dams that keep dirt off the rear shocks, and side air scoops for ESC cooling. You can see A&L's Factory Works battery hold-down brace through the window of the body. The body retails for \$12.95 and the battery brace (no. 2206) for \$10.75.

HOBBY WAREHOUSE Motor Man Battery Dumper

An ideal battery discharger, this unit has light bulbs soldered in series for 24 amps of discharge weight to keep voltage high and resistance low in your batteries. Its unique design allows easy bulb replacement, and it looks cool, too! Part no. MM1500; price \$25.99.



VANTAGE ENGINEERING V410PF Speed Control

The Vantage V410PF speed control features the latest ProFet transistors, which provide an incredibly low "on" resis-



tance of 0.001 ohm. These FETs are nearly twice as large as the more commonly used TO-220 FETs, and they don't require a heat sink. A single push-button allows the user to program in the desired brake, neutral and full-throttle points, and three LEDs light up to show the settings. Torque control settings are adjusted in a similar way. Part no.—ES41P; price—\$215.96.



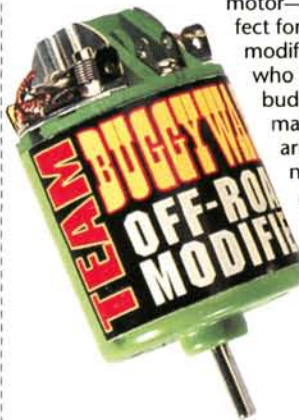
TAMIYA Desert Chevy S-10

Based on the popular Nelson & Nelson stadium racing truck, Tamiya's new Chevy S-10 is one hot truck. Using the proven 4WD TA02 chassis, this truck features oil-

filled shocks, a 540 radio, a three-step speed control and a sweet-looking polycarbonate body.

TRINITY • Buggyweld Modified Motor

Developed under the Team Kinwald banner and in the Speed Gems series of motors, this new modified motor—the Buggyweld—is perfect for the local racer, a new modified racer, or someone who wants to go fast on a budget. The 13-turn double, machine-wound, short-stack armature rests inside the new Epic EZ Flow endbell and can. The motor features easily adjustable timing, precision ball bearings and high-performance brushes and springs. Retail price is \$46.99.



Serpent leads the way into the fast-growing 1/10-scale gas oval class with this superspeedway racing chassis and optional Mega SX-15 engine. Its features include a fully independent suspension, hard-anodized shocks and full ball bearings. An optional 2-speed transmission is also available.

SERPENT Impact SSG



BRP • Road Racin' Outlaws

These new 1/18-scale Road Racin' Outlaws bodies from BRP Model Racing Products are designed for their popular Oval Outlaw cars. The cars are built around a Kydex chassis; they use a mini-motor and are powered by a 4-cell AA battery pack. They're perfect for racing around the house or on the driveway, and they'll run for 20 to 25 minutes on a single charge. Shown here are the Mercedes-Benz and the Stadium Pickup. Also available are a Porsche 911, a Ferrari F40, a GTP body and a stock car. The bodies sell for \$10.

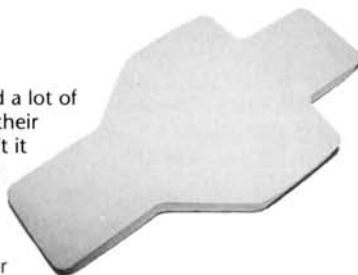


LUNSFORD RACING Losi Titanium Transmission Top Shaft

Want to take a big chunk off your transmission's rotating weight? Try Lunsford's new Transmission Top Shaft. It is significantly lighter than the stock top shaft, yet it's still very strong. The top shaft fits in the Double-X tranny and retails for \$20.



Most racers spend a lot of time working on their cars, and wouldn't it be nice if the cars stayed put? TRC's new foam pad raises the chassis enough for you to work on it and prevents it from rolling off the table. Raising the chassis also prevents tire "flat-spotting," which can ruin



TRC • Foam Work Pad

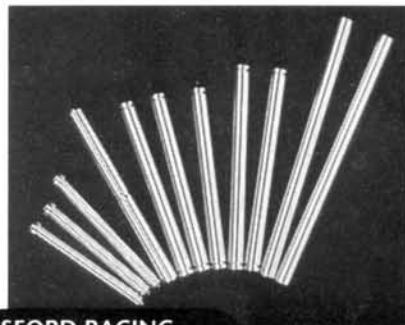
a perfectly good set of foams. The red foam pad costs \$10.95.

TRINITY • Kinwald Hard Ones

These Kinwald Hard Ones 48-pitch pinion gears are fashioned out of steel and are made in Trinity's Zero Gravity configuration. The gears range in size from 12 to 27 teeth, and each gear is case-hardened to a guaranteed 58-62 Rockwell C. The hardening process of the material is consistent up to .0010 into the depth of the gear. This means that the gear would have to be completely destroyed before it would lose its tooth form. Finally, each pinion gear has a black oxidized coating, which helps prevent rusting. Retail price is \$4.99.



LUNSFORD RACING Team Losi Double-XT Titanium Hinge Pins



Looking for that extra edge? Why don't you swap your Double-XT's stock hinge pins with these hot titanium hinge pins from Lunsford Racing. Not only will it reduce the overall weight of your vehicle, but it will also increase your truck's overall durability. Retail price—\$20.



ESP • Clodzilla Power-Ups Motor

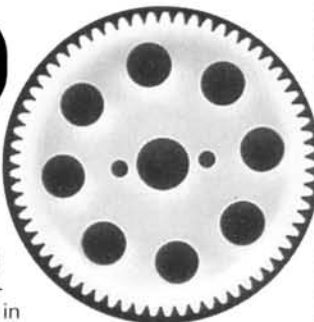
We all want lots of horsepower; now there's a set of matched motors

designed specially for the Clodbuster. These Yokomo-based 19-turn motors provide lots of power and speed, yet still give good run time. One is built for normal rota-

tion, while the other is reversed. Suggested retail price for each is \$89.95.

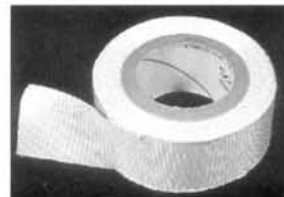
ROBINSON RACING RC10GT Spur Gears

Robinson's white spur gears are machined out of solid nylon and are very durable. Machined gears are more accurately shaped and concentricity is perfect. Spurs are available in 63, 65 and 67 tooth sizes.



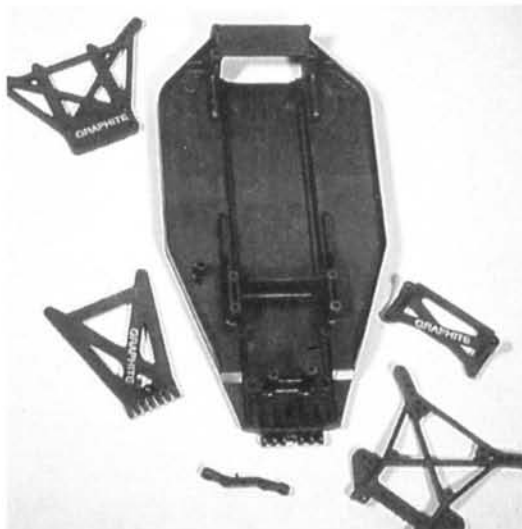
DYNAMITE • Thermal Set Coupler Tape

Dynamite's Thermal Set Coupler Tape virtually eliminates the chance of blowing out your gas car or truck's exhaust coupler. Hot exhaust gases, vibration and crashes all weaken silicone exhaust couplers, and that can mean a quick end to your race. Well, Dynamite's Thermal Set Coupler Tape will help you avoid that. Wrap the 3/4-inch-wide tape around the coupler, and you'll lengthen the coupler's life. The tape comes in 20-foot rolls, and you'll need about 1 foot to wrap a coupler, so a roll should be enough to protect 20!



TEAM LOSI Graphite Parts

Team Losi's graphite parts are substantially stiffer than the stock units. If you need the ultimate in rigidity, these parts are for you. They include arms, chassis with braces, and front and rear shock towers.



Addresses of the companies featured here are listed alphabetically in the Index of Manufacturers on page 232.

TRC • F1/Indy Tires

TRC keeps in step with the times by providing tires for today's F1 and Indy cars. Available in a wide variety of compounds for Kyosho and Tamiya cars, choose rough or pre-trued donuts; a mounted version is also available for Kyosho cars.





HOW TO Kick up Build Your Own

by RICK
SCHWARTZ

IN THE WORLD of R/C cars, only two things are required: a vehicle and a place to drive it.

Driveways and backyards are fine for casual R/C'ers who tool around, chasing the neighborhood dogs whenever the urge strikes.

find a track is commonplace. More important, casual drivers never have a chance to become more involved in the sport because there are no local organized events.

Getting a local track started may be easier than you think! It takes

some common mistakes—as well as save time and money.

ORGANIZATION— FIRST AND FOREMOST

First determine whether a track is warranted. This may be difficult to do because you may face a unique situation. It's like putting the cart before the horse. You may have a small group and think that it isn't worth the effort. On the other hand, you may feel that although the group is small now, when the track has been built, it will attract new racers and increase the size of the group. This is where hobby shops can help. Put out flyers and questionnaires to see whether there's enough interest in the sport to set up a track. Contact the nearest tracks and see whether their racers would come to *your* facility when they're not racing at *their* track. Keep records of their responses; they will come in handy later. If you feel the numbers are there, go for it!

THIS LAND IS YOUR LAND

The next step is the most important: finding a site. For on-road racers, it may be fairly simple; a large parking lot will do. The track can be assembled and dismantled during the same day. For off-landers, it's a little more difficult, because you need a permanent facility.

Make your group official by reg-

BEFORE



AFTER



But for the serious R/C racer, finding a suitable place to practice and compete can be a little more difficult. Driving for over an hour to

work and dedication, but it isn't impossible. I hope the following information will help you to get the ball rolling and avoid making



Even though it rained for weeks, we didn't let that stop us from working on our track. Then this little tornado came through our backyard and let us start all over again...

dirt on your own turf!

n Race Track

istering it as a non-profit organization and then joining one of the sanctioning bodies such as ROAR or NORRCA. Why? Because the biggest stumbling block you'll face when approaching someone to use his or her land is legal liability. Most of the sanctioning bodies provide a minimum of \$1,000,000 in liability insurance for member organizations. For a few additional dollars, the owner of the site can also be insured and protected from any financial risk.

When scouting the area for sites, look for the most isolated spot. Remember, you'll have neighbors, and although you may start out small, you might outgrow your facility and have to start over. Check into the zoning of the site, and try to find out what's planned for the future. There's nothing like spending time and effort on building a track and then finding out that the owner plans to put a fast-food restaurant right on your drivers' stand next year. Your best chance usually comes through your city or county government. Public parks are permanent, and many have available land. Other site possibilities are near water and sewer plants. They usually have enough vacant land around them to accommodate a track.

THE PROPER APPROACH

Having decided on a site and determined that you have the capability to

build the track, your next move is to meet with the landowner and discuss your plans.

Be positive and be prepared. If it's a government body, impress on them that this project won't cost them anything. Your club will build and insure the track; you'll be

responsible for its maintenance; and you'll do whatever is necessary to ensure that you're good neighbors. If you get nowhere with administrative personnel, go to your elected officials. If you can prove to them that it will benefit their voters, they'll help

Obstacle Illusions

The obstacles shown are just a few examples of the twists and turns you can add to your track to make racing more interesting and competitive. Too many obstacles makes for a slow track with a lot of unnecessary turn marshaling; too few, and the track becomes a drag strip to see who has the most powerful motor.

Design and add your obstacles to meet the needs of your club's drivers. They'll be the ones using it the most. Remember, the examples shown here can be lengthened, heightened, widened, or sloped to meet your needs. All you need are a shovel and some imagination.



• **Ski jump**—a long sloping jump to be jumped for distance; it usually drops straight down at the end.



• **Doubles**—timing jump. The main goal is to try to clear both jumps, but some racers take them one at a time. The lower the jumps are, the closer they should be and vice versa.



• **Tabletop**—usually 1 to 3 feet high; has a 4- to 5-foot flat top.



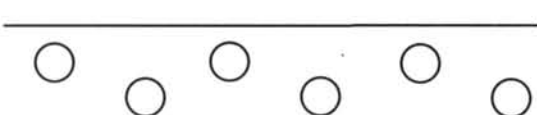
• **Rhythm section (washboard)**—series of small bumps all the way across a section of a lane, four or five in a row (similar to doubles).



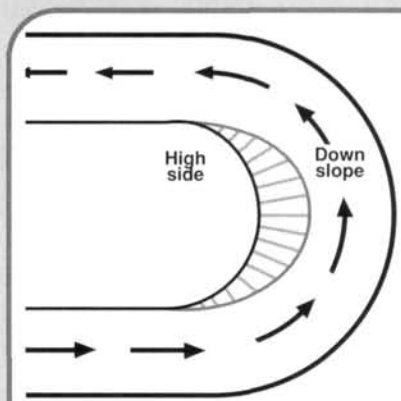
• **Step-down**—used to come from an elevated section; drops straight until you reach the bottom.



• **Shark's teeth**—triangular bumps coming in from the side of the track to form an offset angle



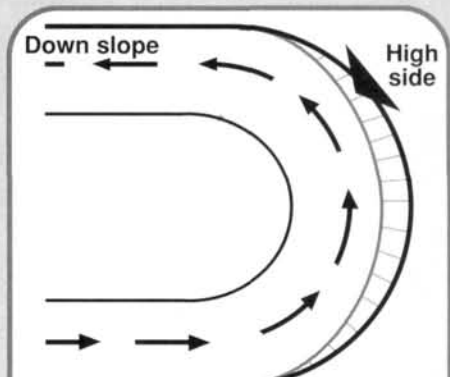
• **Moguls (whoops)**—mounds in a random pattern.



OFF-CAMBER

• **Negative or off-camber turn**—slopes or leans toward the center of the track; drivers must take this turn at a slower pace.

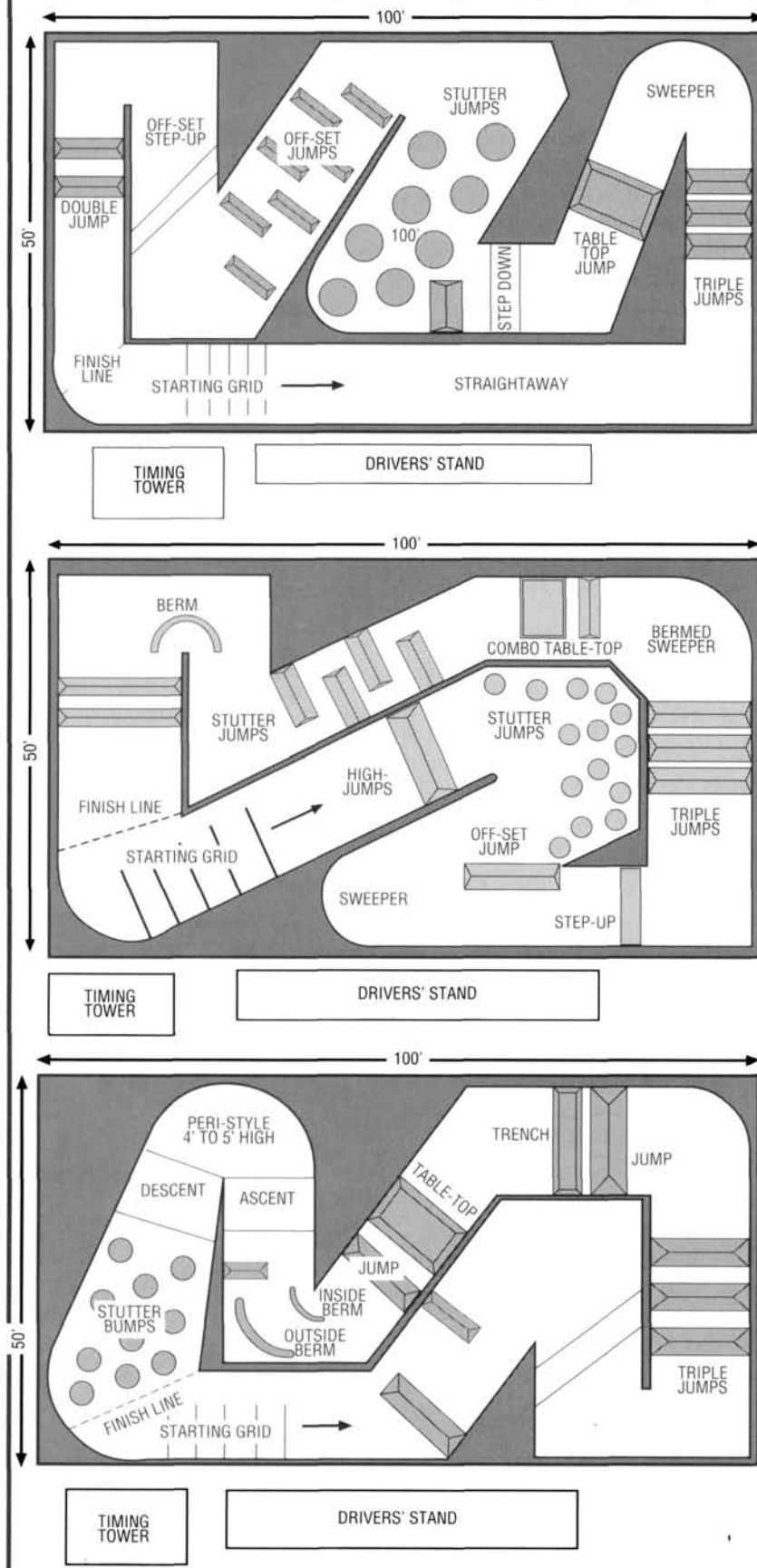
• **Positive or on-camber turn**—also commonly known as a berm. The outside of the turn slopes down toward the center of the track, allowing the driver to bank his vehicle through the turn at high speed.



ON-CAMBER

Keep on Trackin'

Here are a few NORRCA track templates that might help you get on your way.



NORRCA Off-Road Track Specs

Straightaways—12 feet wide, 75 feet long.

Turns—8 feet wide.

Tabletop—4 feet long.

U-turns—6 feet wide.

Turnstiles—approach and exit 4 feet wide.

Whoop-de-do's—4 inches high;
8 inches between.

Banked turns—24 inches high.

Miscellaneous

- A double-jump area should have a long way around as an alternative.
- There should be a two-way traffic barrier to separate cars.
- A 4-inch barrier should separate lanes.
- A 6-inch barrier should separate the track from the spectators.
- Start/finish line should be on a straightaway.
- Finish line should be painted on the track or clearly marked in some other way.
- Hard-to-see corners should be highlighted with white chalk.
- Turn marshals' positions should be clearly marked on the track.
- Orange cones or large metal dots make excellent markers.
- Turn-marshall should wear identifying vests.

Dirt Recommendations

Use sandy loam topsoil with six or seven bags of gypsum to help hold in the moisture. You don't want it too sandy, and you don't want to use too much clay. Too much sand causes the track to break up and make whoop-de-do's; too much clay makes the track overly hard.

If the track's surface doesn't stay wet, coat it with soil penetrator from a garden shop, or laundry detergent mixed with water, or more gypsum. A good mixture is 75 percent loam, 15 percent clay, and 10 percent sand.

Follow the Rules

When designing and building a track, there are only a few hard-and-fast rules—if you want to comply with NORRCA or ROAR rules, that is! Both organizations stress safety as a number-one goal. To ensure that the vehicles stay inside the racing area and provide a safe venue for spectators, the ROAR rule book strictly defines the minimum size of barriers and where they should go in and around the track. For off-road, both organizations also specify a minimum lane width—8 feet. NORRCA goes one step further by providing a sheet with suggested track specifications that include safety recommenda-

tions, obstacle size and composition of the track surface. NORRCA administrator J.R. Sitman will also provide track designs to help with the initial layout. Representatives of both organizations say that their requirements are minimal. Overall width and length, and the placement of obstacles is up to clubs. For more information, you can contact these organizations:

- **NORRCA**, c/o J.R. Sitman—Administrator, 651 W. Foothill Blvd., Ste. 292, CA 91786; (909) 944-5381.
- **ROAR**, c/o Steve Whitney, 1203 Westview Dr., Cocoa, FL 32922; (407) 631-5857.

you. They may even have their parks and recreation department help in the construction.

CONSTRUCTION PHASE

When you've determined how much help is available, design the layout and determine which materials you'll need. Ask your club members for layout suggestions, then draw it out on paper or computer. It's a lot easier to change a layout at this stage than to do it when construction has started.

Remember, in your euphoria of finding a site, you may lose sight of your limitations. You may want to build a track that could host the next IFMAR Worlds, but that might not be a good place to begin. Start small, you can always enlarge later, when your membership has grown.

The main ingredients are fill for a base and surface material. If there's any con-

struction going on in your area, ask the contractors whether they'd be willing to donate some material. They might even agree to have some of their heavy equipment come in to help with the construction.

When the base is in, lay out the lanes with stakes and string. Again, these can be moved if necessary. Then put on the top layer, i.e., fill dirt or a clay-type soil, which will be your racing surface. The finishing touches include



From left to right: Neighborhood Parks Director, Pete Keogh, Director of Parks & Recreation, Jack Doughney, contributing author, Rick Schwartz, and Coral Springs Mayor, John Sommerer.

One Swell Guy

Rick Schwartz has been in R/C racing for six years and was involved in the initial expansion of (and six track rebuilds at) his home club—the Coral Springs Roadrunners R/C Car Club in south Florida. As treasurer of the club, Rick is involved with fundraising and purchasing, and he has dealt with city officials and local businessmen in improving the track. In cooperation with the city government through an "adopt-a-park" agreement and loan program, the club has added electricity, water, bathrooms and a drivers' stand. His knowledge about getting materials and funds have helped make the Coral Springs track one of the premier facilities in Florida. If you have any questions on starting a club or building a track, you can give Rick a call at (305) 344-1983.

OTR—Off-Track Racing

Not everyone has a track nearby, but racing opportunities still exist. For on-road racers, a parking lot with plastic cones makes a great site. For off-road racers, temporary facilities are a little more limited, but they are available. One of the best locations is a baseball infield. Get permission from the owners, and go to town! All you really need are some stakes and heavy colored string. Set up your layout, build a couple of jumps and obstacles out of scrap lumber and you're all set. If you have no dirt surface to race on, change those off-road tires to foams, go back to the parking lot and set up your wooden obstacles. I saw this type of setup in the infield at Lake Whipoorwill, and it was neat.

Remember to use your imagination! The facilities are there if you're willing to look for them.

obstacles, borders and lane dividers.

HOW ABOUT SOME MONEY, HONEY?

That's all great, but how do you pay for it? Having determined which materials are being donated, you have to decide how

much money you need to raise. Your first sources of finance are club members—ouch! Again, remember that a lot of possible sources will not help until they see a facility in place. Ask your members to ask any companies they or their parents do business with for a small contribution. A lot of little donations add up.

Go to your local hobby store for some start-up cash. Explain that an active track will increase their business. If companies will not give you an outright donation, ask

TEAM LOSI TECH TALK

LIGHTEN UP!

If you've been trying to drop some quick weight off your car or truck, and you have a Double-X or Double-X retro-fit transmission, you're in luck. Team Losi now offers lightweight aluminum top shaft/gears for both the 2.19:1 and 2.61:1 ratio Double-X type transmissions. These gears are a one-piece unit made of high-grade aluminum. The gears are precision cut on the shaft, then the entire unit is hard-coated for long life. The part numbers are A-9930 (2.19:1) and A-9932 (2.15:1), and each costs \$11.95.

GET THAT OUT OF HERE!

If you have had a difficult time removing the rear inner hinge pin on your Double-X or Double-XT, give this a try. On the forward, vertical part of the rear pivot support, drill a hole about 1/16-inch diameter. The hole should be in line with the hinge-pin hole and *away from the edge* of the vertical rib. If the hole is drilled correctly, you should be able to push the hinge pin, from front to rear, through the hole using a 1/16-inch Allen wrench.

NEW TRICK STICKERS

Team Losi has added a couple more stickers to their line of precision vinyl cut stickers. First is the addition of Double-XT stickers. Like the Double-X vinyl sticker set, these are available in fluorescent pink and (A-8325) and fluorescent yellow (A-8326). Each set includes three Double-XT stickers and two larger Team Losi stickers. Price: \$5.95/set.

The other addition to the sticker line is the large, white sticker that's a whopping 24 inches long. They're perfect for the top of front windshields on full-size cars, or for tool boxes. The part number for these is A-8320, and the price is \$7.95.

CONGRATULATIONS...

to Brian Kinwald for winning the 1994 ROAR Truck Nationals with his new Double-XT truck. Brian drove a great race (as always) and finished ahead of the field to take another national title. Congratulations also go to Kevin Moore for dominating and winning the British National Championship tour with his Double-X car.

* * *

Let us know what's going on! Address your questions and problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710.

BUILD YOUR OWN RACE TRACK



Coral Springs Rebuild— A PERSONAL SAGA

Our club has been in existence for 10 years. Six years ago, we moved to our present site and have been upgrading ever since. Every year when we change the track layout and make improvements, we always say this will be the last time, and the following year we start over again. I hope that this time will be the last time we undertake a complete track makeover!

We decided to widen the track by 30 feet and elevate the new section. Our next undertaking was finding enough fill. I drove around the city, stopping at construction sites to ask for contributions. I usually got the answer, "Where were you two weeks ago? I couldn't give it away." Driving to the track one day, I noticed that there was a front-end loader at the adjacent water plant; it was loading dump truck after dump truck with material. I discovered that the earth being loaded was used to filter the water, and I asked if we could get some. The next thing I knew, 20 loads of fill were on site for the expansion.

I contacted the city, and they were kind enough to supply a Bobcat (a small earth mover) to build the raised section. The next step was buying clay. South Florida doesn't have any red clay, so it's shipped in. I contacted a local trucking company, told them we were non-profit, explained our predicament and was rewarded with a wholesale rate.

When the clay had been delivered, we were ready to go. Unfortunately, the weather didn't cooperate. When we were ready to start, we had two of the rainiest weeks of the year. The Bobcat got stuck, and the bulldozer we hired to grade the track left deep tracks.

The grading of the track and the spreading of the clay had to be done by hand. After that, we dug the drainage areas. We dug pits approximately 3 feet deep, put in crushed rock, covered that with fine screening to let the water through, put on the dirt and covered that with sod. We used five pallets of sod to complete the infield.

The next step was putting in the borders. We used 8-foot landscaping timbers, stacked them two high, and anchored them with 1/2-inch-diameter rebars (steel bars). On portions of the infield, we used painted timbers as track borders to prevent cars from jumping the track.

The final steps included building a wooden frame for the tabletop, putting in the jumps, and laying some drainage pipe. It took us two months to complete the track, but it was worth it. Word got around, and on opening day we had over 75 racers. The best part is, they said they'll be back.



them to sell you the materials you need at cost. Remember to stress that the club is non-profit and that everyone involved is volunteer. You might even ask the land provider to lend you some start-up funds and set up a repayment schedule. Emphasize again that you will be improving the property.

When you're up and running, invite elected officials to come and see the races. Hold an event with your local hobby store. Let the local media know about the track. The more the community knows about the facility, the more help you'll get. ■

1995



Racing season at a glance

by George Gonzalez



IN THE U.S., there are many sanctioned, regional and divisional races scheduled throughout the year. ROAR* (Radio Operated Auto Racing) has more than 100 regional races scheduled, many of which are qualifiers for the larger ROAR National Championships and, ultimately, the IFMAR* World Championships. NORRCA* (National Organization for Racing Radio Control Autos) has as many races scheduled as well, and many of them serve as qualifiers for the NORRCA National Championships and NORRCA World Cup events.

In Europe, EFRA (European Federation of Racing Autos) has many regional races planned, including many regional championships. Europeans will represent a large percentage of the competitors at the IFMAR World Championships. In Japan and the Far East, FEMCA (Far Eastern Model Car Association) will also hold many regional and national championships, which also serve as qualifiers for the

IFMAR World Championships.

Hundreds, if not thousands, of non-sanctioned races will take place this year. Unfortunately, we can't cover them all, but, you can look forward to reading about the ROAR and NORRCA National Championships, the IFMAR World Championships, and many the larger, non-sanctioned, sponsored races in future issues.

The Ninth Annual Reedy International Race of Champions

January 20-22 —M&M Hobbies Raceway, 137 No. Vander, Corona, CA
The party continues as the best racers from the U.S., Europe and Japan gather to celebrate Mike Reedy's birthday in grand style. The racing classes include the 2WD Open, the 4WD Open and the Invitational Class. The 2WD and 4WD Open classes are for all racers, but the Invitational Class drivers have to earn the right to compete based on their past performances at national or world-class events. The Invitational drivers compete in a six main, point match.

Tamiya Championship Series

January 29—Larry's Performance R/C, Waterford, MI (810) 683-5529; May 21—T&T R/C Cars, Plano, TX, (214) 517-0562

Get ready...
get set...GO!



The Tamiya Championship parking-lot racing series has several events throughout the year (as of this writing, not all locations and dates have been finalized). The classes consist of all types of Tamiya's parking-lot products from F1, Sedan/FWD to a GTP/GTO class. All classes will run stock and modified classes separately. For more information, contact Eric Sands at Tamiya America—(714) 362-2240.

The Ninth Annual Winter Championship

February 23-26—West Coast R/C Club, Tampa, FL

Some racers argue that the Florida Winterchamps, sponsored by Team Losi, is the hottest off-road race outside the IFMAR Worlds. The classes include Stock 2WD, Modified 2WD, Modified Truck, 4WD Modified and an Over 40 race. Entries are limited, and many people love to go to this race, so sign up; you'd better hustle! Besides, who wouldn't want to be in sunny Florida in February.

The Ninth Annual ProLine Cactus Classic

March 17 to 19—Scale Racing Sports (SRS) Raceway, Scottsdale, AZ

The Cactus Classic has bloomed into one of the country's premier, non-sanctioned racing events. Although the Cactus Classic is best known for its laid-back environment, the racing action is among the hottest in the country. Many non-sponsored racers have the rare opportunity to go toe-to-toe with some of the fastest racers in the country. Six racing classes are scheduled, including 2WD, 4WD and racing truck categories.

U.S. Oval Masters

March 31 to April 2—Lake Whipoorwill Raceway, Orlando, FL



The U.S. Oval Masters is considered by most oval racers to be the ultimate round 'n' round race of the year. There are four classes: Stock, Modified, Expert and Invitational. An Enduro thrown in here and there spices up the competition. The race is held at one of the country's premier ovals, and once you're finished racing, you and your buds can hang out at Disney World!

NORRCA Off-Road Nationals

June—location: not set at press time.

The sun is not the only thing that's going to be hot this summer, as the country's top racers compete for the prestigious title of NORRCA National Champion. The NORRCA Nats is a full venue with 11 different racing classes. The factory teams will battle it out in the Seventh Annual Team Cup Challenge for the title of Best Off-Road Racing Team of 1995.

NORRCA Dirt Oval Nationals

July—Racer's Haven, Bakersfield, CA

The Dirt Oval Nats guarantees high-speed, sideways action. Racing classes include modified and stock, as well as classes in Sportsman and Expert. Give Oval a try. All

it takes is one lap, and you'll be hooked.

ROAR Off-Road Stock Nationals

July—location: not set at press time.

This is the first of three tough new divisions of ROAR's Off-Road Nats. With equally matched cars and, in many cases, equally



matched racers, super-tight, action-packed racing is the norm. Classes include: 2WD Stock, 4WD Stock, 15-year-old/under 2WD Stock and 40-year-old/over 2WD Stock.



RACING SEASON AT A GLANCE

IFMAR 1/10-Scale Electric Off-Road World Championships

August—Yatabe Arena, Tokyo, Japan
By far, the most anticipated event in 1/10-scale electric off-road racing, this event (held every other year) is tentatively scheduled for August 1995. More than 120 of the world's most talented R/C racers will compete in either the 2WD Modified or 4WD Modified classes. The winners usually enjoy all the endorsements associated with being the fastest off-road driver in the world.

ProLine Endless Summer Classic

August 18 to 20—M&M Hobbies, Corona, CA

Although the Endless Summer Classic is a non-sanctioned, off-road race, more than 200 contestants, including many of the top factory team drivers, are expected. Three Sportsman and three Expert classes ensure that there's a racing class for everyone, and the fun-in-the-sun atmosphere is worth the price of admission.

Roar On-Road Gas Nationals

August—location: not set at press time.

This week-long racing event features some of the hottest gas roadcourse racing in the country. Racing classes include 1/8 and 1/10-scale pan and full-suspension categories.

Roar Truck Nationals

August—location: not set at press time.

This is the second of the three new divisions of the ROAR Off-Road Nats. A full weekend of in-your-face, bumper-to-tailgate truck racing is what you can expect at the ROAR Truck Nats. More than 200 racers from all over the country will compete in five different racing classes: Modified Truck, Stock Truck, 15-year-old/under Stock Truck, 40-year-old/over Modified and 40-year-old/over Stock Truck.

NORRCA Paved Oval Nationals

August—Lake Whipoorwill Raceway, Orlando FL

The Paved Oval Nats attracts hundreds of contestants, including many of the best paved oval racers in the world. The coveted title of NORRCA Paved Oval National Champion will once again be up for grabs, and the contestants will stop at nothing to secure it. The amazing realism of paved oval racing will astonish you, and the speeds will blow you right out of your seat.

NORRCA 1/10-Scale Gas Truck Nationals

September—location: not set at press time.

The 1/10-Scale Gas Truck Nats is an incredibly exciting event. Just imagine an entire weekend of nothing but nitro-burning racing trucks. There will be racing classes for sportsman and expert drivers and, quite possibly, a long Enduro race.

NORRCA Off-Road World Cup Modified Electric & Gas Truck Champs

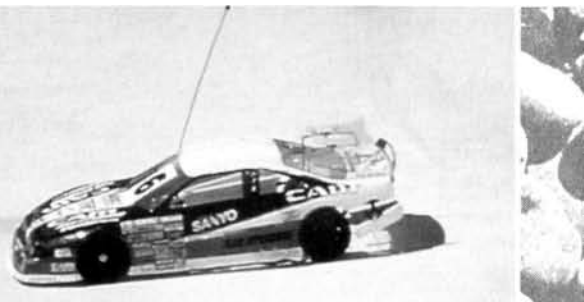
September—location: not set at press time.

This interesting event features both electric and gas off-road racing in the same event. With almost every class of off-road racing represented, you can count on seeing plenty of action. Throughout the year, NORRCA holds many regional and national races that serve as qualifiers for this event, so you can expect many of the best drivers in the world to attend, as well as many talented, non-sponsored racers.

NORRCA Paved Roadcourse Nationals

October—location: not set at press time.

This is 1/10-scale roadcourse racing at its best. More than 150 contestants, including many of the top on-road racers from all over the country, will be present to compete for the national title. With several classes in both Sportsman and Expert, there will be a racing class for everyone.



ROAR Off-Road Modified Nationals

October—location: not set at press time.

This is the third and final new division of the ROAR Off-Road Nats. The ROAR 2WD and 4WD Off-Road National Championships are two of the most honorable titles in R/C racing, and for many top drivers, the last chance to qualify for the IFMAR World Championships. Even though there are only two racing classes, the giant turnout of contestants makes this event one of the largest of its kind.

Cleveland Indoor Champs

November 24 to 27—Holiday Inn, Independence, OH

Hosted by NOCAR, this event is the only major 1/12-scale indoor carpet race held in the country. Limited entries make for a quick roster fill-up. There are two classes—Stock and Modified—and 8-minute races and qualifiers.



1/8-Scale Off-Road Regionals and U.S. Open

Dates and locations not available at this time.

Aimed at replacing the now defunct PRO-CAR gas racing series and still in its developing stages, this new series will consist of three regional events that qualifies racers for the main event—the U.S. Open. This event will feature not only U.S. drivers, but also international competition. Only U.S. drivers can attend the regionals, though. The series will have two classes—1/8-Scale Buggy and Truck. A new division for 1/10-scale trucks and 4WD buggies is also being formed. For more info, contact Tom Grogg at (217) 398-3630.

Keep on reading *Car Action*, and look for comprehensive race coverage with in-your-face action photos of the racing events mentioned in this article.

**Addresses are listed alphabetically in the Index of Manufacturers on page 232*





THE PADDY WAGON

Parzival Seeto of Fremont, CA, sent us pictures of a lot of really cool-looking Readers' Rides, but it was this one that really grabbed our attention. Parzival's home-built Paddy Wagon half-track is all-wheel drive and took four model kits to complete. The kits involved were a Tamiya front-wheel-drive chassis kit and 4WD chassis kit, and a power shovel/dozer kit. Topping off the chassis is a 1/24-scale Shovel Wagon model from Monogram, and a Tamiya Tamtech radio system controls the vehicle. Very wild-lookin', Parzival! Congratulations on your unique machine.

Readers' Rides of the Year

by John Howell

THIS YEAR, we received a ton of particularly cool Readers' Rides—more than in any other year I can remember. Well, when it was time to choose Car Action's Readers' Ride of the Year, we decided to do things a bit differently. Instead of selecting one awe-inspiring vehicle, we opted to honor five creative individuals who didn't necessarily have the resources to put

thousand after thousands of dollars into their vehicle, but who nevertheless came up with a great R/C ride. These are the ones that we enjoyed the most when they came in—either because of their uniqueness or their plain old simple design that had been executed in a clean fashion. So take a peek; we hope you enjoy taking a second look at them as much as we did.

ON THE TRAIN GANG

Fashioned after Allen Gaines's full-size Orange Blossom Express tank train, John F. Beecher III of Lafayette, IN, started his project with a Chicago Models Intl. tank powered by two stock 360 motors, two Hitec ESCs, and two 6-cell battery packs. John completely scratch-built the body out of .060-inch-thick polystyrene plastic with real rivets. The boiler is made of 1/4-inch-thick Plexiglas tubes and has a functional wooden smokestack, and a bell directly behind the smokestack rings when the vehicle is in motion. The Orange Blossom Express also has working headlights and a cowcatcher, which is easily removed when John wants to enter the vehicle in car-crushing competitions. It's a hot ride, John. Congrats!—and good job.



YOU COULD TAKE OUT YOUR WHOLE BLOCK

When this Readers' Ride from Normand Lajoie of Belleville, Ontario, Canada, hit our desks, we all laughed for a while. We're not trying to be mean; it's just that it's the coolest-looking thing, and we all got a big kick out of it. Normand's ride is a Russian SS-25 Sickle with a Transporter Erector Launcher, and it took him roughly three years to complete. The truck (well, maybe "truck" isn't the best description) is based on three Tamiya Falcon front ends and four Falcon gearboxes. It features a custom-made aluminum chassis, two Novak 610RVs and 12 battery packs. A total of four Kyosho 360 motors get it rolling, while 50 ball bearings keep it running smoothly. RAM lights and sound units add to the beast's realism. It's really wild, Normand.

QUAD MANIA

This funky-looking submission comes from Steve Cockburn of Dover, DE. I used to ride ATVs, so when this one came in, I thought it was just too cool.

Apparently, Steve spent roughly four months scratch-building this project. With help from his local hobby shop—Hobby Works—Steve used components from manufacturers such as Futaba, Royal, Andy's, Pro-Line, Tamiya, K&S, and Autographics to complete it. Pretty wild, Steve! Congratulations!



WINTER WINNER

Now, this is an R/C vehicle that you don't see every day! It's a working replica of a Polaris XLT Indy snowmobile, and it's the handiwork of Tim Pettman of Champlain, MI. Nearly 2 feet long, the fiberglass, aluminum and brass snowmobile took Tim roughly four years to complete, and he says the details are to scale. Its front and rear suspensions are completely functional, and the front and rear lights

allow Tim to drive it on those long winter nights. Powered by a Trinity modified motor and a Novak 828 ESC with an 11-cell battery pack, this baby can crank up to 20mph in the snow. Congratulations, Tim; it's a really nice lookin' machine.

Congratulations to all the winners here. They've each earned \$100 for their efforts. Start sending your entries for this year's contest. Who knows? Next time, it might be your vehicle in the spotlight.



IFMAR

1/12

Sacre Bleu!!!

by ERNIE PROVETTI

FROM JULY 11 through July 16, 1994, more than 120 of the best drivers in the world from more than 19 countries battled for the right to be called the fastest driver in the world. The IFMAR championships is an enormous undertaking, and race director Christian Dauriac and his organization (the MRC Creteil and the Mini CAF) were up to the task.

Most of the pre-race hype focused on Associated and Trinity. Everyone assumed that there would be a tremendous battle between Joel Johnson (Trinity), Masami Hirosaka (Associated) and Mike Blackstock (Trinity). This was supposed to be a classic battle between the old guard—the Associated 12L—and the new Trinity Revolver 12P.



This might not be a familiar face right now, but I bet you'll see many more pictures of David Spashett in the winners' circle.



Photos by Ernie Provetti

SCALE WORLDS

Notice that I said, "was supposed to be." Maybe everyone in the U.S. was expecting this, but someone forgot to tell Corally and one very talented (and not as well-known) David Spashett of Great Britain. It was evident early on that Spashett and the Corally guys had done their homework. Spashett handled the best racers in the world with ease—no sense of pressure or nervousness—and a single-minded determination to take the world championship back to Europe. That's exactly what he did; he was awesome!

QUALIFYING

If I had to summarize Qualifying in one word, it would be "Spashett."

Although Mike Blackstock of Trinity and Kevin Jellich of Associated flirted with the top spot on several runs, it was simply Spashett and Corally's destiny.

After round one, Blackstock was on top with 30/8:04.13. He was followed by Corally's Anders Nilsson with 30/8:04.79. Craig Drescher (Associated), David Spashett (Corally) and Joel Johnson (Trinity) made up the rest of the field. The fastest laps for most of the American drivers ranged from 15.6 to 15.8. The rumor flying around the track, however, was that Spashett could go 15.2, but he had several crashes during his first qualifying run.

Round 2 saw the Magic Man take the top honors with 30/8:03.01, followed by Nilsson, Blackstock, Drescher and Spashett. After the first day, there were two Trinity cars, two Associated cars and six Corally cars! Where was Masami? How about 15th?—more than 21 seconds back! Masami was desperately trying to use the Sanyo 1700 SCRC cells while most of the field was on Panasonic P-170s. Obviously, the Panasonics lasted longer, but the Sanyos had much more bottom-end punch. It would appear that if Masami were to make the show, he needed to move to Panasonics.

Round 3 was the beginning of the end for the Americans. Spashett, who was obviously now the fastest driver on the track, limited his crashes and turned in top honors with 30/8:01.12. Were 31 laps possible? I thought

that four drivers—Spashett, Johnson, Blackstock and Hirotsuka—could do it. When all was said and done, seven drivers had cracked the 31-lap barrier.

Round 4 was what the Europeans had been waiting for. Their champion put it all together and turned in an incredible 31/8:11.78. This would stand as the pole position and the fastest time for the entire weekend. Could anyone beat Spashett? This was a recurring question in the pits. Some felt that Mike Blackstock had a good chance because he was on a 31/8:09 pace, but he crashed a few times in the last minute, leaving him just short in second position. Others felt that the Magic Man and Masami would deal with the pressure more easily than the young Brit when the money was on the line in the finals. I really couldn't disagree with this thinking; it all seemed logical. Spashett proved us all wrong. He not only handled the pressure, but he also did so with ease.

QUALIFYING RESULTS

After nine rounds of qualifying and three days of battle, the scores were as follows: Spashett (Corally) with 31/8:11.78; Blackstock (Trinity) with 31/8:14.67; and Jellich (Associated) with 31/8:14.85. The rest of the field was made up of Hirotsuka, Johnson, Oscar Jansen, Anders Nilsson, Michael Fransson, Andrew Griffiths and John Orr. There were three Associated 12Ls and Reedy motors; two Trinity Revolver 12Ps and Kinwald motors; and five Corally SP12 G-2 cars and motors.

FINALS

When Saturday (the day the champion would be decided) rolled around, the tension that usually surrounds

a world championship event didn't seem to be present. Most people I talked to thought that Spashett would win unless he cracked under the pressure. Who would provide the pressure? That was obvious, too: Joel Johnson, Mike Blackstock and Masami Hirotsuka—not a bad lineup.

As always, the practice Main seemed to be a psych-out game played by the manufacturers: Spashett ran his slowest race of the week and dumped at the end. Was this a psych, or was it poor planning? We won't ever know for sure. One thing we did find out is that it wouldn't happen again on Saturday afternoon. Although Blackstock, Hirotsuka and Johnson handled the warm-up easily, the real issue on everyone's mind was the first leg of the World Championships, which was scheduled for noon.

Again, the feeling here was that the Americans would have to exert a lot of pressure on Spashett to have any chance of winning. Unfortunately (for everyone except young Spashett),



Left to right: Joel Johnson (second), world champion David Spashett and Masami Hirotsuka (third).

this never happened. The first Main was a repeat of Qualifying, with Spashett winning easily. The only race was between Johnson and Blackstock, who duked it out for 8 minutes and finished just a car's length apart. Johnson was second, and Blackstock was third.

Final 2 presented more of the same. In a little less than three hours, David Spashett had won the World Championship and seemed to use about as much effort as his father did when he turned his car on. It seemed that easy! It was obvious that the Corally car had been dialed in to perfection on the long carpet track, and Oscar Jansen of Corally did a comparative job on the horsepower. It was an awesome combination. Once again, the Magic Man finished second behind Spashett (locking up second),

Masami finished in third, and the rest of the group seemed as puzzled as I was.

Should they run a third Main? Two questions had to be settled here: could Spashett complete the hat trick, and who would finish third: Hirosaka or Blackstock? If Spashett won the third round, Blackstock would be third; if Hirosaka won the third round, he would finish third. It was obvious at the start of the third leg that Masami wanted a podium spot. Anyone who has ever seen Masami race has, at one time or another, felt chills just watching him negotiate his way around the track. Even though this wasn't his finest hour, he didn't let his fans down. In what had to be the most exciting of the three rounds, Masami battled Spashett with everything he had. He seemed to will his car around the track and, in the

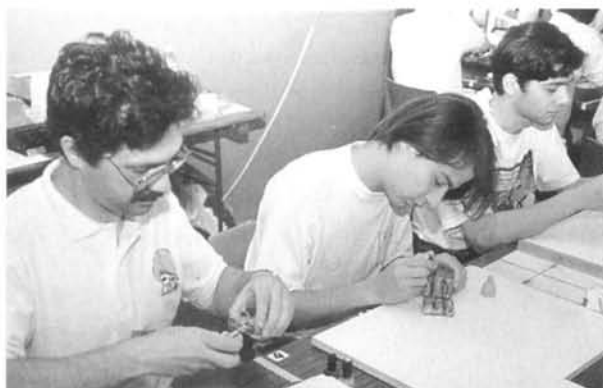
end, he did what he had to do, and what others had tried to do all week-end: he beat Spashett. But although Masami won this battle, Spashett and the Europeans won the war.

In the aftermath and during the trophy presentation, several things became quite evident as the Europeans (especially the Brits) reveled in their victory. David Spashett had become the first world champion from



Here's R/C Car Action's newest ace photographer, Ernie Provetti. (Pssst! Ernie: you might want to take the lens cap off!)

Europe since Phil Booth (some 15 years ago). The Europeans served notice to the Americans and the rest of the world that they are now the new powerhouse in 1/12-scale on-road (for 6-cell carpet, that is) and finally, that a new company—Corally—that isn't too well-known in the U.S. could give the bigger, more established companies a run for their money. In light of the latter, Spashett's win was good not only for the Europeans but also for the entire industry. Well done, David and Team Corally! ■



Tech personnel checked every cell and marked each one to ensure that only approved cells were run in the races.

WINNERS' CHART

Finish	Qual.	Name/country	Car	Motor/Batteries	ESC	Radio	Servo	Tires(F/R)	Pinion/Spur
1	.....1	David Spashett/GB	.....Corally SP12G2	.....Corally 14x3/Orion Pan	.....Helbing 3000	.....Futaba	.....Air 94141	.....Corally	.....24:108
2	.....5	Joel Johnson/USA	.....Trinity 12P	.....Trinity 17T/Trinity Pan	.....Novak HPC	.....Airtronics	.....Air 94141	.....TRC	.....28:100
3	.....4	Masami Hirosaka/Japan	.....Assoc. 12L	.....Reedy 16T/Orion Pan/San	.....Novak HPC	.....KO Propo	.....KO FET	.....Ellegi/Yokomo	.....22:100
4	.....2	Mike Blackstock/USA	.....Trinity 12P	.....Trinity 15T/Trinity Pan	.....Novak HPC	.....JR	.....JR 3025	.....TRC	.....30:100
5	.....9	Andrew Griffiths/GB	.....Corally SP12G2	.....AGR 15T/Orion Pan	.....Helbing 3000	.....Futaba	.....Air 94141	.....PK	.....24:110
6	.....10	Jon Orr/USA	.....Assoc 12L	.....Reedy 15T/Orion Pan	.....Novak HPC	.....KO Propo	.....Air 94143	.....Jaco/Yokomo	.....23:100
7	.....7	Anders Nilsson/Swed	.....Corally SP12G2	.....Corally 15x3/Orion Pan/San	.....Intronics	.....KO Propo	.....Air 94141	.....Corally	.....21:108
8	.....8	Mickael Fransson/Swed	.....Corally SP12G2	.....Corally 16x1/Orion Pan	.....Intronics	.....Futaba	.....Air 94141	.....PK	.....21:108
9	.....6	Oscar Jansen/Holland	.....Corally SP12G2	.....Corally 15x3/Orion Pan	.....Helbing 3000	.....Futaba	.....Air 94141	.....Corally	.....21:108
10	.....3	Kevin Jelich/USA	.....Assoc 12L	.....Reedy 15T/Reedy San	.....Novak HPC	.....KO Propo	.....Air 94143	.....Jaco/Yokomo	.....23:100

Tech HEAD

by Frank Masi

WELCOME TO THE FIRST "Tech Head" column. Each month, I'll attempt to shed light on some of the R/C hobby's more complicated and confusing topics. This month, I'll cover basic motor maintenance. Future columns will include detailed information on suspension travel limiting, tire

technology, gearing, chassis dynamics and more. If you have a particular topic you'd like to see covered in this column, write to me at "Tech Head", c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897; or e-mail me on the Internet at frankm@airage.com (be sure to title your mail "Tech Head").

2 Gearing. I can't overemphasize the importance of proper gearing.

Undergearing your motor (using a smaller pinion) will never hurt, but overgearing (using a pinion that's too large) is the major cause of excessive heat, wear and damage.

If your motor becomes too hot to touch, plan to change the brushes and, possibly, to cut the comm. If you continue to run the motor at high heat levels, you'll destroy the comm and the brushes and you may weaken the magnets.



Proper gearing is critical to motor life. It's better to be undergeared than to be overgeared.

Four Steps for Longer Motor Life

1 Cleaning. Do this after every two runs, if you can, and use a spray cleaner that's formulated for use on electric motors. Contrary to what your local hotshot tells you, avoid spraying any part of the motor other than the brushes and the commutator. Use the spray sparingly, and don't let it seep into the bearings or bushings. If it does, it may allow small particles of dirt and debris to become lodged in the bearings or between the armature shaft and the bushings.

The only time I recommend that you flush the entire motor with spray is during a complete rebuild, when it's completely disassembled.



Clean your motor regularly using a good-quality motor spray such as Trinity's Motor Doctor.*

3 Cut the comm. The best way to prolong the life of your motor is to continually "skim" the surface of its commutator using a lathe. By skimming frequently, you'll ensure that minor damage won't get the chance to "snowball" into a major surface irregularity, which can usually be removed only by a major cut.

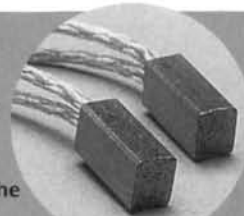
I know that few people have motor lathes, but in my experience, there's always at least one person at every track or hobby shop who does. Usually, the lathe owner will be happy to cut your comm—for a couple of bucks (\$3 is the going rate for a good skim). It might even be cheaper for you and two or three friends to pool your resources and buy your own lathe. Always remember to install new brushes whenever you have your comm cut.



The best way to maintain your motor is to cut the commutator using a lathe (this one is from C&M Mfg.).*

4 Brushes. Two things you should know about brushes: how to pick the right type for your motor and how to tell when they're worn. Try to stay with brushes of similar size and material to those that came with your motor when it was new. For example, most off-road motors come with full, soft brushes. The large contact area of the full brush ensures high conductivity for the large amp draw that's common with off-road, and the soft material is easy on the commutator.

Change brushes frequently, especially when the motor is run under high-amp-draw conditions, e.g., off-road and superspeedway racing. Don't be deceived by the brush's size; looking at its length alone is not enough to gauge its condition. Real commutator damage comes from brushes that are pitted, burnt, or glazed. If the brushes are in any way discolored, or if their contact area is irregular, change them immediately. Believe it or not, it's much cheaper in the long run to buy new brushes regularly than to pay for a complete rebuild—or to buy a new motor!



Check and replace the brushes periodically. Learn to recognize the signs of wear and damage.

*Addresses are listed alphabetically in the Index of Manufacturers on page 232. ■

(continued on page 230)

OUT OF THE BOX WINNERS!

208 RADIO CONTROL CAR ACTION

From the track to the parking lot,
this is the R/C action as **you** see it.

by Chris Chianelli

Grassroots

RACING

WELL, HERE'S the first edition of "Grassroots Racing." In the same way as "Back Lot" is MY PAGE—MINE!—this is YOUR PAGE—YOURS!! It belongs to you—the R/C car enthusiast who loves to race with his friends and family—the optimistic racer on a budget who euphorically screams

euphemisms out loud when faced with the possibility of actually doing some evenly matched CCR (cost-controlled racing)—the individual who's in it for the greater fun of it all—the grassroots racer.

I promise you one thing: you will never see a sponsored racer's name on this page unless it's in a tale of how a

local hero kicked his butt. We at *Car Action* want to see what's going on and how you're organizing races at your local track, hobby shop and parking lot. Even if you and your buddies just run truck races in your backyard, hold club meetings in the garage and have trained the family dog to turn-marshal, I

want to hear about it!

Send in the photos! Snapshots; 35mm slides; Polaroids—anything!; we'll take it. Don't forget the trophy girls.

A special section will address upcoming races, and in a subsequent issue, we'll feature the local hot "trigger-fingers" who won those races. (Who knows? A big sponsor may take note!)

To get things rolling, I'll print the phone numbers of hobby dealers, hobby chains and distributors that already have CCR programs set up. If you're a dealer, or just a bunch of fun lovers in search of race program, give them a call.

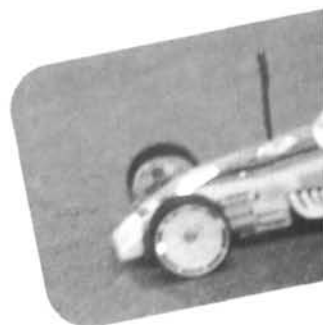
Hobby Shack has led the way in setting up parking lot races at its chain of retail stores. Prizes (left) and advertising (right) are part of their success formula. Below: No, he isn't "de-bugging" the track; it's traction enhancement—a sprayed-on mixture of sugar and water (1 pound of sugar to 1 gallon of water, shaken not stirred, spread evenly). WARNING!—may cause local ant populations to explode!



Above: an old fire hose, plow disks and duct tape—just one way to lay out a parking lot track.

Left: having plenty of elbow room is very important for driver comfort and concentration.

Right: some portable tracks are made with hinged boards. Setup is fast: just slip in the hinge pins!

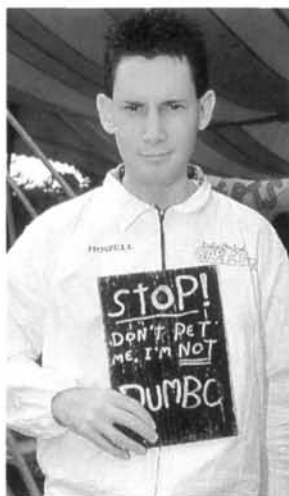


Mud Bus Concours line-up at Walt's Hobby in Syracuse, NY.



CHIANELLI CLUNKER!

OK. I screwed up. In the October '94 "Scoop," I incorrectly reported the site of race no. 2 in Tamiya's R/C Championship Series. Held at Sheldon Hobby's in San Jose, CA (not wherever I said before), it attracted more than 100 entrants (no thanks to me!). That's what I get for letting my dog Luna file photos for me. Shown here, again, is event coordinator Eric Sands and first-place Sedan Modified winner Tom Aakre. Those great-looking sedans are really gaining momentum. I hear Tamiya is really boosting their race program. I'll tell you more next time.



On the scene with John-John (John "Doogie" Howell and John-Boy Huber). Left: I hate to be the one to tell you, Doogie, but the sign is quite appropriate. You see, you and Dumbo do have a certain feature in common—and it ain't a long memory or the ability to fly. Right: you may not be John-Boy, but you sure look it. And you did miss something—hygienically impaired!



The winners of 1/10-scale Gearbox A-Main carpet at Walt's Hobby. From left to right: Joey Ladouceur, Derrick Netzley, Steve Miller, Eric Lauzon, Michael Hartman and TQ winner Laurent Ladouceur.

Want to join the ranks of smiling trophy winner in Syracuse, NY? Contact: Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY; (315) 453-2291 (exit 5, Rt. 690 W.).

Above: K/N Speedway in Stratford, CT, holds a very inexpensive class of racing called "J-Car SK Stock." No. 89—a 1/10-scale version of those cool, full-scale open-wheel modifieds—belongs to Frank Holmes of East Haven, CT. Right: the pretty side of the parking lot. Model Airplane News (our sister publication) contributor Rich Uravitch built this beautiful Parma



Cobra for scale action in the local lot. You should see this thing in color!

Someday I'll be the IFMAR-1/10th champion.

When I get older I would like to race the real thing. I was lucky enough to meet Dale Earnheart. I told him that in six or seven years he should start looking in his rear view mirror.



Sincerely yours,

Michael Coia
Michael Coia

Calgary, Alberta, Canada: this helpful Newfoundland "Bailey" retrieves Steve Tang's car and brings it back to the pits. What a good girl! Steve says she'll next be trained to marshal races. Uh-oh! What if she starts bringing the cars back to the pits?



Call now!

For those of you who are interested (dealers or racing customers) here are a few hot-line phone numbers to use if you have any questions or would like to start a program in your area.

Bolink Legend Series
(404) 963-0252

Tamiya R/C
Championship Series
(800) TAMIYA-A

Kyosho R/C
Sport Racing
(800) 682-8948;
ext. 085F

Hobby Shack
Parking Lot.
(714) 964-8846

Hobby Town USA
Parking Lot.
(402) 434-5050

Trinity's Street
SPEC Series
Hasn't been set up yet;
watch this spot (no, not
literally; get on with your
work or something).

THE FINAL WORD

If you've been patient enough to read this far, you're probably hoping that I'm going to give you my super-secret, hot brush-and-spring combo. Well, I'm sorry to disappoint you, but that's not going to happen. You'll have to work on finding your own hot combination. Instead, I'll pass along some of the

general rules that I learned during 1,086 dyno runs:

- Most major, nationally available

Most major, nationally available brands of hard brushes are pretty much alike in performance; that is, they're very, very good, and they produce just about the same numbers and react to tuning in the same way.

brands of hard brushes are pretty much alike in performance; that is, they're very,

very good, and they produce just about the same numbers and react to tuning in the same way. The same is true of soft com-

pounds. So, if you have a favorite brand of brush, don't expect to have to change it. By the same token, don't expect major perfor-

mance gains by switching from one well-known brand to another. If none of these brands looks familiar, give one or several of them a try; you won't be disappointed!

- Soft brushes typically produce more low-end power; hard and silver brushes typically produce more high-end power and allow higher peak rpm. Most brushes are clearly labeled as to type and compound.

- More brush-face pressure on the commutator produces more power, especially at the bottom end of the power curve. This is true of both hard- and soft-compound brushes. Too much face pressure starts to cut down on peak rpm, and it shortens commutator life.

- If you want more punch without sacrificing peak rpm, cut your brushes and keep the same brush tension; you shouldn't have to alter gearing. If peak rpm is of little concern, e.g., in a tight, twisty, on-road or off-road course, use a full-face brush and increase brush tension until you have the power you're looking for; you may find that going up a tooth on the pinion will make your performance smoother and faster.

- Not everyone drives in the same way. The current fast guy's brush and spring combination may not be the best for your driving style. Don't be afraid to experiment with different brush compounds, face cuts and spring tensions, but keep a written record of what you've done and how it affects your lap times. That way, if you go too far astray, you can always go back to what worked well for you.

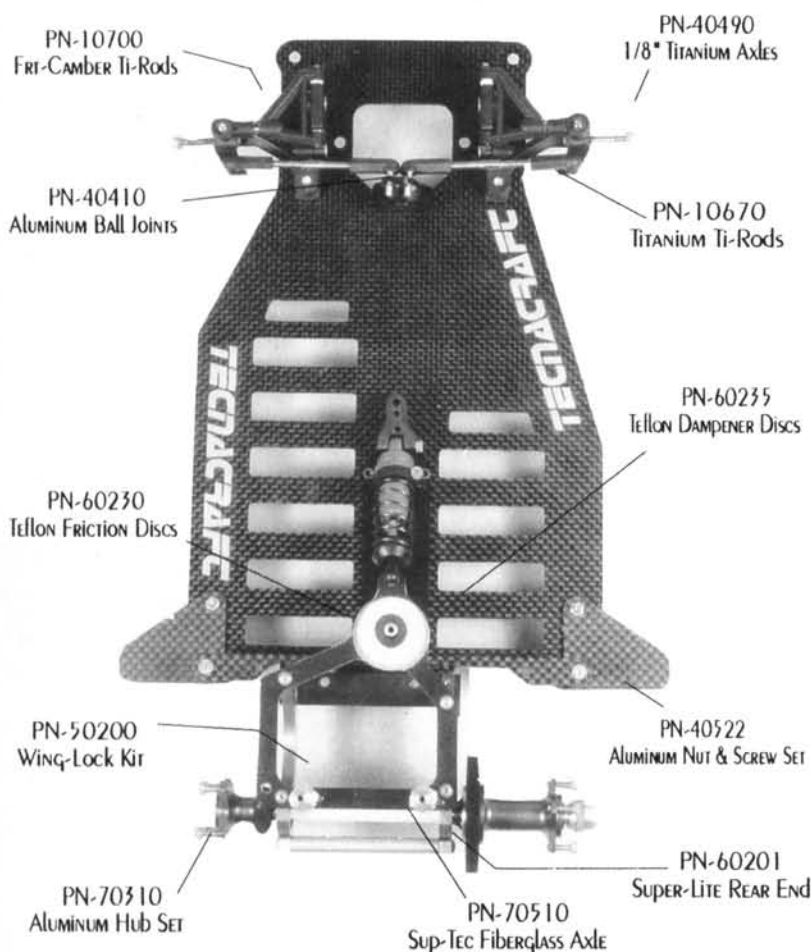
- Finally, remember that the results of brush and spring tuning can be very subtle. You may not know that you're going faster if the difference is only $\frac{1}{10}$ second or so per lap; over a 4-minute oval race, however, that adds up to the equivalent of an entire lap! Time yourself and keep records, and you'll gradually see an improvement.

Do you have a favorite brush-and-spring combination that you'd like to share with the readers? Write to me, care of R/C Doctor, *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897, and I'll pass those tips along in a future article!

*Addresses are listed alphabetically in the Index of Manufacturers on page 232. ■

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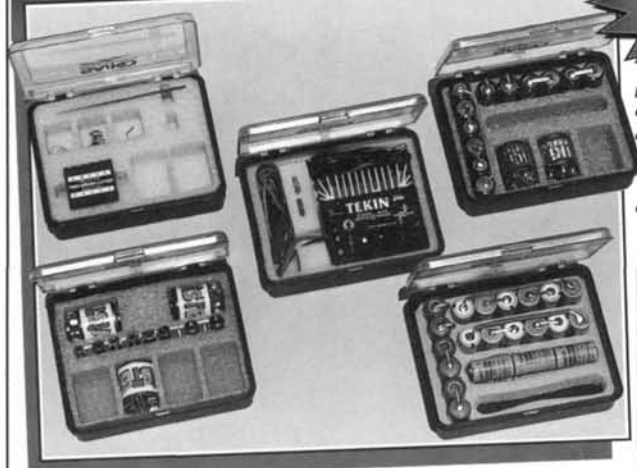
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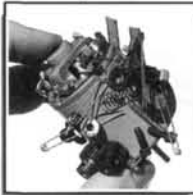
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ADVERTISER INDEX

Ace Hardware	73-77
Airtronics	4
America's Hobby Center	81-85
Apex Models	57
Associated Electrics	16-17, 64-65, 96-97, 167, 231
Aveox	168
B&B Software	72
B&T R/C Products	226
Bennett Equipment	27
Boca Bearings	208
Bolink R/C Cars, Inc.	183
BRP	161-162
Bruckner Hobbies	163
BSR Enterprise	224
Byron Originals	228
C&M Team Cobra	215, 217, 219
Cats West	208
Competition Electronics	186
Crickit Racing Products U.S.A.	27
Dahm's Racing Bodies	8
Deans	187, 232
Dillon Racing	229
Downtown Hobby	35
Elite Speed Products	10
Endless Horizons	233
ERI	228

ESP	228
Extreme Motorsports	227
Great Planes	42-45
Hitec	157
Hobbytown USA	156
Hobby Products International	30, 92
Hobby Warehouse of Sacramento	220-223
I.M.S. International	229
J&M Hobbies	184-185
JR Remote Control	46
Kyosho	173, 191, 225
Litespeed	50
MaxMod Mini Sports	31
Maxtec	54
Model Rectifier Corporation	C4
Moore's Ideal Products	102, 151
Mugen USA	88
Nitec	57
Nikko America	18
Novak Electronics	209-211
Parma/PSE	87, 168
Progressive Technologies, Inc.	12-13
Pro-Line USA	7, 15, C3
Protoform, Inc.	187
Race Prep Racing Motors	33
Race Tech Motorsports	193
Racer's Choice	203
Ranch Pit Shop	47
Rattner North America	168

RC Tech, Inc.	35
R.C.C.A. Tech Mart	164-166
R/C Motorsports of Miami	216
Robinson Racing Products	192-193
RPM	199
Saiko Racing Products	232
Savon Hobbies	200-201
Schumacher USA	224
SCI Corporation	72
Sheldon's Hobbies	194-197
Stormer Hobbies	204-207
Tamiya America, Inc.	C2, 41, 147
Team Losi	28-29, 146, 152-153, 218
Tecnacraft	230
Tekin	80, 188-190
Testors Corp.	168
Thorp Manufacturing, Inc.	23
Top Racing Products	86
Total Racing Connection	155
Tower Hobbies	174-181
Traxas	169-172
Trinity Products	3, 9, 11, 20-21, 39, 51, 103-134, 141
Ultimate Hobbies	226
Vantage Engineering	192
Wagon Hill Hobbies	72
Wheels & Wings, Etc.	182
World Class Inc.	227
Yokomo Ltd.	58-59

INDEX OF MANUFACTURERS

A&L Mfg., 505 North Smith Ave. #105, Corona, CA 91718; (909) 735-5249.
Airtronics Inc., 11 Autry, Irvine, CA 92718; (704) 830-8769.
Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9337.
Bich'n Bodies, 4903 Cloverfield Rd., Pearland, TX 77584; (713) 485-0413.
Bennett Equipment, 900 E. 1300 South., Romney, IN 47981-9619; (317) 448-5881.
Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245; (404) 963-0252.
BRP Inc., 1575 Lowell St., Elyria, OH 44035; (216) 284-0270.
C&M Mfg./Team Cobra, P.O. Box 701353, West Valley City, UT 84170; (801) 974-5757.
Calandra Racing Concepts, 6860 Stanwix Ave., Rome, NY 13440; phone and fax (315) 338-0867.
Class Recreational Products, Rte. 1, Box 187A, Utica, NY 13502; (315) 724-8052.
Competition Electronics, 3469 Precision Dr., Rockford, IL 61109; (815) 874-8001.
Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316.
Deans Connectors, 116 W. 19th St., Box 511C, Higginsville, MO 64037.
DuraTrax/Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826; (217) 398-6300.
Dynamite, distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.
Elite Speed Products Mfg., 3923 East Mount St., Columbus, OH 43227; (614) 231-4170.
ESP Mfg., 6215 Lou Ave., Unit C, Crystal Lake, IL 60014; (815) 455-5440.
ETA Racing, 1031 Henry Dr., Alabaster, AL 35007; (205) 663-5042.
Extreme Motorsports, 6266 Oakridge Rd., San Diego, CA 92120; (619) 229-1511.
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718; (714) 455-9888.
HODR, distributed by OFNA Racing (see address below).
Hobby Products Int'l. (HPI), 22600-C Lambert St., Ste. 904, El Toro, CA 92630; (714) 837-3250.
Hobby Warehouse of Sacramento, 8950 Osage Ave., Sacramento, CA 95828; (916) 381-7491.
IFMAR, see ROAR below.
JR Remote Control, distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-0022.
KO Propo, 25-10 Sendagi, 3-Chome, Bunkyo-ku, Tokyo, Japan.
Kyosho/Great Planes Model Distributors (see address above).
LAVco, 2646 Dupont Dr., Ste. #20-491, Irvine, CA 92715; (714) 771-0191.
Litespeed, P.O. Box 4765, Spokane, WA 99223; (509) 535-2717.
Lunsford Racing, 619 First Ave. E., Albany, OR 97321; (503) 928-0587.
MIP, 746 E. Edna Place, Covina, CA 91723; (818) 339-9007.
Motion Graphics, 2645 Robert Arthur Rd., Westminster, MD 21158; (410) 848-0008.
Model Rectifier Corp. (MRC), 200 Carter Dr., Edison, NJ 08817; (908) 248-0400.
NORRCA (National Organization for Racing Radio-Controlled Autos), 1651 North Foothill Blvd., Ste. 292, Upland, CA 91786; (909) 944-5381.
Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715; (714) 833-8873.
O.S./Great Planes Model Distributors (see address above).
OFNA Racing, 22600D Lambert, Ste. 1009, Lake Forest, CA 92630; (714) 586-2910.
Pro-Line USA, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781.
Protoform, 5455 Southwest Blvd., Hamburg, NY 14075; (909) 646-7638.
PSE, distributed by Parma Intl. Inc., 13927 Progress Pkwy., North Royalton, OH 44133; (216) 237-8650.
Race Prep, 852 S. Hwy. 89, Chino Valley, AZ 86323; (602) 636-1955.
Racer's Choice, P.O. Box 405, Medinah, IL 60157; (708) 980-4863.
ROAR (Radio-Operated Auto Racing), 1203 Westview Dr., Cocoa, FL 32922; (407) 631-5857.
Robinson Racing Products, 4968 Meadowview Ln., Mariposa, CA 95338; (209) 966-2465.
RPM Inc., 14978 Sierra Bonita Ln. Chino, CA 91710; (909) 393-0366.
S&K Racing Products, 607 East Market, Panama, IA 50216; (515) 673-6930.
SCI Corp. of America, P.O. Box 13099, Sarasota, FL 34278.
Serpet, distributed by RC Motorsports of Miami, 4715 NW 157th St., Ste. 204, Hialeah, FL 33014; (305) 620-0005.
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Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728.
Tekin Electronics, 940 Calle Negocio, Ste. 140, San Clemente, CA 92673; (714) 498-9518.
Thorp Mfg., 4054 E. Mission Road, Pomona, CA 91766; (909) 622-6518.
Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228; (214) 613-3300.
TRC (Total Racing Connection), 2211 Charter St., P.O. Box 1058, Albemarle, NC 28802; (704) 982-0507.
Trinity Products, 1901 E. Linden Ave. #8, Linden, NJ 07036; (980) 862-1705.
Vantage Engineering, 681 Main St., Waltham, MA 02154.



CHRIS'

BACK LOT

This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire Car Action staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, 251 Danbury Rd., Wilton, CT 06897.

I Need You!— To Go Make Noise

Happy New Year everybody!....OK, enough of the sickeningly sanctimonious, socially acceptable salutations of the season. Let's get down to business. What New Year's resolutions are you going to make, and how are you going to change the world?—in our case, the R/C racing world. I know this is going to sound sappy, but you've got to start with yourself.

It's going to be "throw-up time" for Chris if I get anymore letters and Internet communications that go something like this: "My local hobby shop doesn't offer a race program. Oh, no... oh, no...What can I do?! I'm lost; I'm forgotten...waah! waah! And not only that, but my parents feed me my formula at least 4 degrees too cool." Look, you must start viewing yourself differently—more realistically. It's *your* money flowing across the counter in a direction that's away from you and *toward* the hobby shop owner. According to the natural laws of "money in motion and the Doppler-dollar effect," this means that *you're* the boss! You're the end user—the consumer—and the customer is always right!. That's why your boss is your boss. His money flows away from him, to you. If you want it to keep on flowing, you'll do what he says.

Don't get the wrong idea. I'm certainly not telling you to go to your hobby dealer and pound your fist on the glass display case while making demands such as, "I want a CCR [cost-controlled racing] program and I want it *now*!" You'd probably get thrown out—deservedly so, I might add. I am suggesting, however, that you get as many of your R/C buddies together

(remember there's strength in numbers) and go in and talk over the possibilities with the hobby dealer. If you don't personally know enough racers, ask if a bulletin can be posted: "Anyone interested in cost-controlled racing?...blah...blah...blah...." Bet you find the vast majority of hobby shop owners are reasonable, intelligent businesspeople who are willing to cooperate—especially if they're not the only hobby shop in town.

The hobby shop owner will realize the potential, but he can't read your mind. Instead of letting him continue to scratch his head wondering why no one has bought that beautiful, \$800, stainless-steel monster truck, go in and tell him what you do want. There are plenty of programs being offered for you both to choose from. There's:

- Bolink's Legend Series
- Kyosho's R/C Sport Racing
- Tamiya's R/C Championship Series
- Trinity's new Street SPEC Parking Lot Racers

—to name just a few. (The Trinity scheme is featured in this month's "Inside Scoop.") You decide which you like, and the hobby shop owner will investigate which offers him the most incentive. The two of you will have to work it out....

The only way we'll make fair and affordable racing a lasting reality is if you, the consumer, speak up. You're the only one who can do it. Every successful business knows that consumers create the demand and industry responds. Stop whining and start demanding; go make some noise already! ■